



American Water Works
Association

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Water Sector Resource Typing Guidance

Contents

Contents	i
Acknowledgements.....	2
I. Project Overview	3
II. Background	3
III. Scope	5
Relationship to Emergency Response Plan in America’s Water Infrastructure Act (AWIA)	6
Relationship to AWWA Standards.....	6
FEMA and the Resource Typing Library Tool	6
IV. AWWA Resource Types	7
Attachment A: 2008 Through 2019	9
Water Process	9
Water Distribution	10
Wastewater Process.....	11
Wastewater Collection	12
General Supporting Resources.....	13
General Supporting Resources.....	14
Attachment B: Personnel Resource Types	15
Attachment C: Team Resource Types	39
Attachment D: Equipment Resource Types.....	89

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This project updates and replaces the 2008 American Water Works Association (AWWA) Water/Wastewater Mutual Aid and Resource Typing Manual, as the Water Sector Resource Typing Guidance (RT Guidance). This RT Guidance is a collaborative effort utilizing the expertise of Federal, State, and local partners to enhance the readiness and response capability of the entire water sector. AWWA would like to specifically thank the Federal Emergency Management Agency (FEMA) National Integration Center (NIC) for entering into a Memorandum of Agreement (MOU) to jointly develop content for the National Incident Management System (NIMS) resource management documents and support AWWA industry standard development. Additionally, AWWA would like to thank the following for their support in developing this manual:

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I. Project Overview

This project updates and replaces the 2008 American Water Works Association (AWWA) Water/Wastewater Mutual Aid and Resource Typing Manual. The new guidance has been developed and prepared for integration into an AWWA Standard and the Federal Emergency Management Agency's (FEMA) Resource Typing Library Tool (RTLTL). Resource typing is one component of a utility's overall risk and resilience management strategy that includes maintaining an emergency response plan (ERP), applying National Incident Management System (NIMS) principles, establishing mutual aid and assistance agreements, and considering business continuity planning needs, as provided in the Utility Resilience Index (URI).¹ This guidance facilitates the development of resource types for water sector personnel, teams, and equipment, allowing for the development of mission-ready packages and allowing for expedited mutual aid requests and responses.

II. Background

Effective resource management programs and executed mutual aid agreements significantly increase the readiness and response capacity for a utility. Combined, these two components, allow a utility to identify available incident response resources, potential gaps in response capability, and regional mutual aid assets that may mitigate the impact an incident may have on a utility's system.

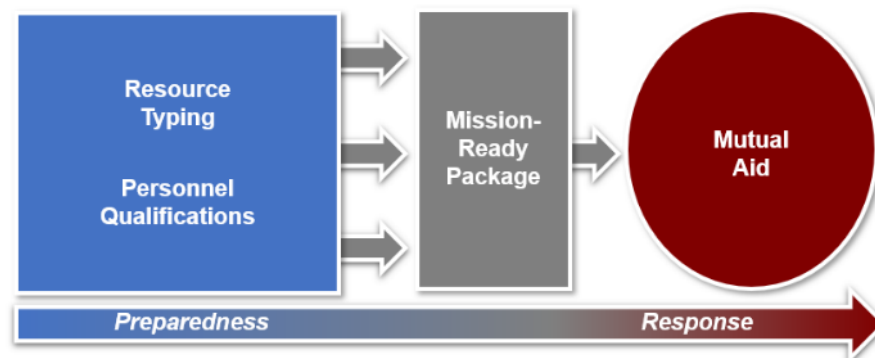
The need for resource management and mutual aid for the water sector was realized as early as 1942 when the New York State Mutual Aid Plan for Water Service in Case of Emergencies was developed to "maintain adequate, effective and safe water service under any possible emergency that may arise, either as a result of war or from natural causes."² This mutual plan described measures to prepare employees to operate in emergency situations with limited supervision, identify response resources, utilize surrounding utilities for support and system redundancies, and improve the overall resilience of a utility to mitigate the impact of a disaster. These actions were necessitated by war but fully characterize the intent of resource management and mutual aid policies utilized today.

Resource management and mutual aid is an essential component of NIMS, as it provides Federal, State, and local jurisdictions a standardized means to provide, coordinate, and manage resources in incident response operations and is composed of resource typing, credentialing, inventorying, and mutual aid. Mission Ready Packages (MRP) use NIMS resource typing criteria to describe expected mission parameters and identify the resources needed, which is a critical component of mutual aid response (Figure 1).

¹ Morley, K.M. (2012) Evaluating resilience in the water sector: Application of the Utility Resilience Index (URI). (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3506045)

² Dappert, Anselmo F. (1942) New York State Mutual Aid Plan for Water Service in Case of Emergencies. *Journal - American Water Works Association*, 34(2):189–199.

Figure 1. Resource Management Path to Mutual Aid



Resource Typing and Personnel Qualifications

Resource typing is defined by FEMA as, “defining and categorizing incident resources by capability...establish a common language for discussing resources by defining minimum capabilities for personnel, teams, facilities, equipment, and supplies.”³ Resource typing, or “identifying and typing resources” in the preparedness phase, is a foundation of effective resource management and mutual aid. The objective is for a utility or jurisdiction to assess and inventory internal resources to determine their capacity to respond to incidents and identify resources that may be necessary to address potential gaps. A gap may be mitigated with direct capital expenditure (e.g., buy the equipment) or through a mutual aid agreement.

Mission-Ready Packages (MRP)

Mission Ready Packages (MRP) build on resource typing by “adding additional components such as pre-scripted mission statements, limitations, required support from other sources, time to readiness, personnel costs, equipment costs, travel costs, and other costs.”⁴ These additional components facilitate the efficient mobilization of resources while also supporting cost tracking for reimbursement associated with an incident.

Mutual Aid

Most jurisdictions do not have all the resources necessary to effectively respond to the various incidents that may occur. To address a capability gap, jurisdictions may rely on assistance from intrastate or interstate partners through mutual aid. Mutual aid agreements allow jurisdictions to define the parameters for sharing personnel, teams, facilities, equipment, and supplies for supporting incident response. These agreements typically address topics such as licensure recognition, liability, interoperable communications, reciprocity/reimbursement, and other areas of support.

The AWWA support utilities in developing and coordinating mutual aid by facilitating the establishment of Water/Wastewater Agency Response Network (WARN). This is a network of “utilities helping utilities” through intrastate mutual aid agreements and protocols to access specialized water sector response resources such as personnel, utility-specific heavy equipment, tools, and supplies to provide rapid response support to affected utilities. Participating in WARN enhances a utility’s ability provide and receive mutual aid resources during an incident and likely prior to Federal and State government aid.

³ Federal Emergency Management Agency (2017). National Incident Management System (NIMS).

⁴ Retrieved from <https://www.emacweb.org/index.php/learn-about-emac/module-positions/mission-ready-package>.

III. Scope

In the period since the 2008 Water/Wastewater Mutual Aid and Resource Typing Manual was released, the nation has faced numerous disasters that have stressed the water sector's operational capacity and response efforts. After-action reports^{5,6} developed following Superstorm Sandy, and Hurricane Harvey and Irma consistently identified opportunities to improve future response efforts through more efficient deployment of resources; trainings on resource management, reimbursement, and the development of MRPs; and identification and mobilization of equipment resources. The goal of this RT Guidance is to address these opportunities for improvement and provide updated resource types to strengthen preparedness and mutual aid response efforts in the water sector.

A key objective of this revision process was to integrate lessons learned from recent water sector mutual aid deployments, reconcile legacy resource typing information, and structure the guidance into terms that enable water sector stakeholders to implement resource management principles effectively and efficiently. This was accomplished by preparing a crosswalk of three guidance sources based on specific requirements for personnel, teams, and equipment capabilities in alignment with FEMA protocols.

- **AWWA Water/Wastewater Mutual Aid and Assistance Resource Typing Manual:** Published in 2008, the manual consists of 19 team-typed resources, 4 personnel-typed resources, 6 equipment-typed resources, and descriptions of 5 additional types of water sector-specialized equipment.
- **National Emergency Management Association (NEMA) NIMS Public Works Typing:** Consists of 21 team-typed resources and 4 personnel-typed resources, and corresponding MRP guidance for these teams. The MRPs were derived from the AWWA 2008 Resource Typing Manual and the corresponding resource types.
- **FEMA RTLT:** Database consists of legacy water sector resource types issued between 2005 and 2017, specifically 15 team-typed resources, 4 personnel-typed resources, 5 water sector-specific equipment resources, and 7 additional supporting public works resources.

When combined and redundancies are eliminated, these three sources result in 53 unique teams, personnel, or equipment resource types. This combined package was reviewed by a national stakeholder group to assess which resource types were most essential to water sector response needs, which reduced the list of 53 to 36 specific resource types. Of the 36 final resource types, AWWA and FEMA adopted 28 of the 36 resource types. The remaining 8 resource types, those that were not deemed exclusive to the water sector, are included in this manual and labeled as “interim” until the resource types are approved through industry stakeholders and FEMA. The “interim” resource types may still serve as planning guides in the water sector, and this guidance will be updated as resource types are approved. Attachment A includes a visual crosswalk of teams, personnel, and equipment from the AWWA 2008 manual to assist partners in identifying updates and new resource types.

The 2019 RT Guidance is intended to address the resource typing component of resource management. Resource typing is an essential building block of successful preparedness planning and mutual aid during emergency response. Successful adoption of an effective resource typing program will provide the water

⁵ AWWA (2013). [WARN: Superstorm Sandy After-Action Report](#)

⁶ AWWA (2018). [Hurricanes Harvey and Irma After-Action Report](#)

sector with a thorough understanding of the response capability within a system, identify essential response equipment, develop essential personnel, and staff response teams, which can, in turn, increase the resilience and effectiveness of the utility and allow the utility to support others during an incident.

Relationship to Emergency Response Plan in America's Water Infrastructure Act (AWIA)

Under section 2013 of AWIA, community water systems must conduct a risk and resilience assessment and prepare an emergency response plan (ERP). According to AWIA, the utility, when preparing the ERP, must consider “plans and procedures that can be implemented, and identification of equipment that can be utilized, in the event of a malevolent act or natural hazard that threatens the ability of the community water system to deliver safe drinking water.”

A utility that integrates resource typing into their emergency planning is able to 1) determine what resources they can effectively mobilize to support themselves or deploy via mutual aid to assist others and 2) assess the limitation of their response capability. A utility that has implemented resource typing is well positioned to respond in a timely and effective manner that enhances the overall resilience of their system.

Relationship to AWWA Standards

The American National Standards Institute (ANSI)/AWWA J100: Risk and Resilience Management of Water and Wastewater Systems, is a standard designed to enable water utility owners and operators to make sound decisions when allocating scarce resources to reduce risk and improve resilience. It provides a methodology to analyze and help manage risks and resilience due to man-made and natural hazards to water and wastewater systems using a seven-step process rooted in asset characterization. As provided in Section 4.1 of J100, asset characterization is used to determine which assets, if compromised by an incident, malevolent or natural, could result in prolonged or widespread service interruption or degradation, injuries, fatalities, detrimental financial losses to the utility, or degradation of regional economic activity. In addition, resource typing is recognized in J100 as an indication of a utilities level of resilience in the Utility Resilience Index. This guidance will assist utilities in developing a resource typing program based on the assets assessed and needs identified for enhancing resilience and mitigating risks.

The ANSI/AWWA G440: Emergency Preparedness Practices is a standards document designed to serve water, wastewater, and reclaimed water utilities in defining the minimum requirements to establish and maintain an acceptable level of emergency preparedness for identified and perceived risks. Section 4.5.1 of the G440 discusses the development of emergency plans, including an emergency response plan and supplemental plans/procedures to address preparedness, mitigation, protection, and response to hazards and threats that may affect a utility's operational capacity. Resource typing is one of the plans/procedures identified in Section 4.5.1 as a fundamental crosscutting effort addressing a utility's preparedness and response capability. This guidance will assist utilities in developing a resource typing program as recommended in G440.

FEMA and the Resource Typing Library Tool

FEMA's National Integration Center (NIC) is responsible for managing the implementation and administration of NIMS and all its subcomponents. The RTL is an online catalogue of NIMS resource types for positions, teams, facilities, and equipment developed by the NIC to support jurisdictions in using resource types based on a common standard and capability. AWWA developed water sector-specific resource types utilizing the current format and guidance provided by the FEMA NIC in order to

streamline the adoption and hosting of the resource types in the FEMA RTLT database. It is important to note that utilities and jurisdictions may request resources beyond those proved in this guidance. All emergency response partners should be familiar with resource types for Incident Command System (ICS) positions and types related to response partners.

IV. AWWA Resource Types

AWWA utilized the current FEMA resource typing format in developing the water sector resource types. Table 1 lists the 36 resource types, including the 28 approved and the 8 interim resource types.

Table 1. AWWA Resource Types

Table 1. Water Sector Resource Types	
Attachment B: Personnel	
<ul style="list-style-type: none"> • Civil Engineer • Damage Assessment Team Leader – Public Works • Environmental Compliance Specialist – Water Sector Infrastructure • Generator Support Team Lead – Water Sector Infrastructure • Hydraulic Modeler • Initial Assessment Team Leader – Water Sector Infrastructure • Laboratory Technician Specialist – Water/Wastewater • Structural Engineer • Utility Worker Specialist – Water Sector Infrastructure • Wastewater Operations Team Leader • Water Operations Team Leader 	
Attachment C: Teams	
<ul style="list-style-type: none"> • Damage Assessment Team – Public Works • Debris Clearing and Removal Team – Public Works • Generator Support Team • Incident Management Team – Water Sector Infrastructure • Initial Assessment Team – Water Sector Infrastructure • Locating Team – Water Sector Infrastructure • Maintenance and Repair Team – Light Equipment Public Works • Operations Team – Wastewater Treatment Facility • Operations Team – Wastewater Treatment Facility • Plant Utility Control Systems Team – Water Sector Infrastructure • Repair and Start-Up Team – Wastewater Treatment Facility • Repair and Start-Up Team – Water Treatment Facility • Repair and Start-Up Team Lift and Pump Stations – Wastewater • Repair and Start-Up Team Water Pump Facilities – Water Production • Repair Team – Water Distribution System • Repair Team Sewer Mains – Wastewater • Sewer System Closed Circuit Television Team – Wastewater • System Flushing and Flow Testing Team – Water Distribution • Water Main Leak Locating Team – Water Distribution 	

Table 1. Water Sector Resource Types	
Attachment D: Equipment	
<ul style="list-style-type: none"> • Sewer System Cleaning – Wastewater • Water Valve Maintenance (Truck/Trailer) – Water Distribution • Water Pump, Dewatering • Water Pumps, Drinking Water Supply – Untreated Source • Water Pump, Wastewater • Water Pump, Water Distribution 	

Attachment A: 2008 to 2019 Comparison

The figures below provide a visual comparison of the 2008 Water & Wastewater Mutual Aid and Assistance Resource Typing Manual and the 2019 Water Sector Resource Typing Guidance. This visual reference will assist utilities in updating current documents to the new types, as well as providing a brief overview of the teams, personnel, and equipment as provided in this guidance.

Figure 2. Water Process

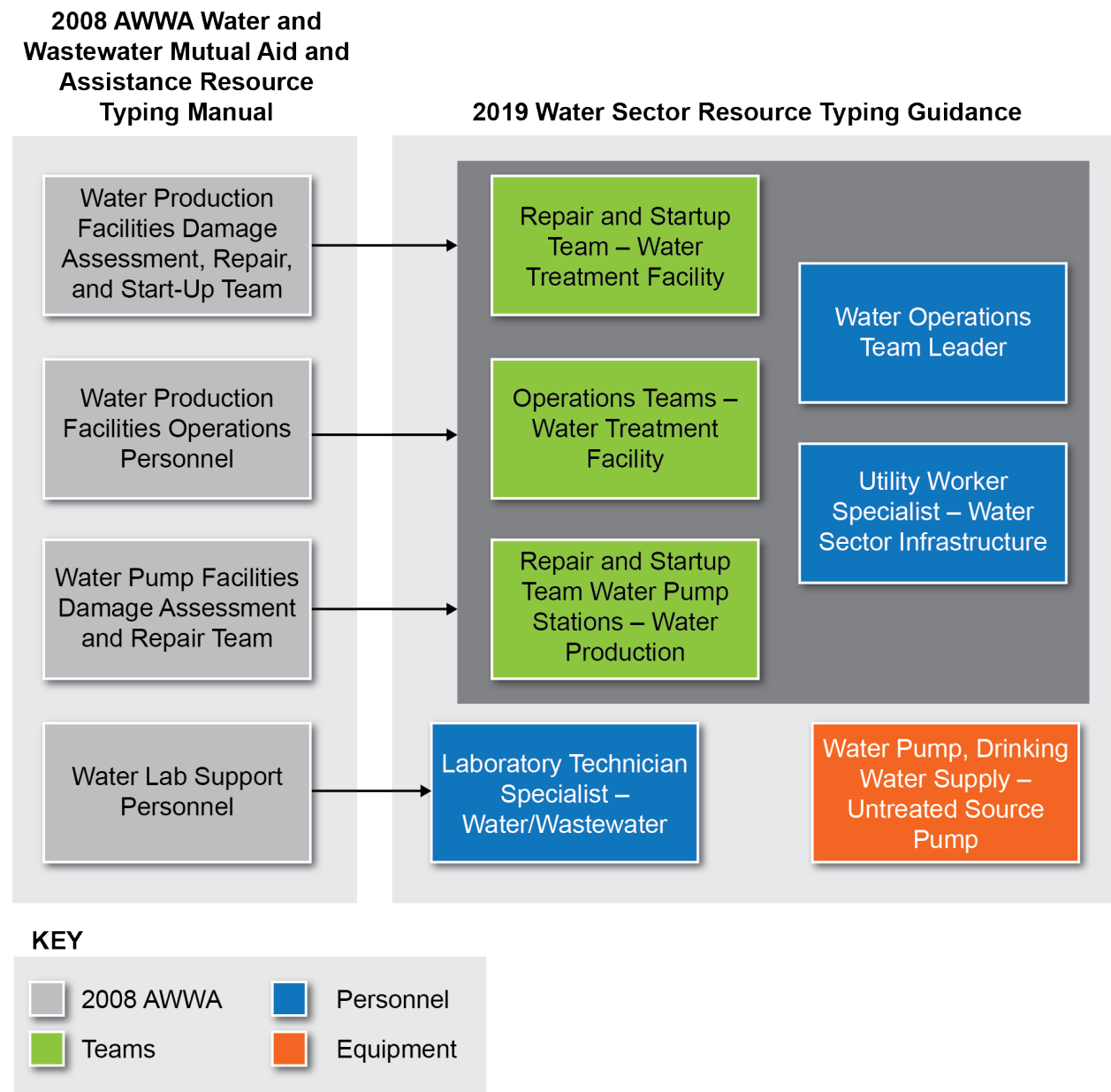


Figure 3. Water Distribution

2008 AWWA Water and Wastewater Mutual Aid and Assistance Resource Typing Manual

2019 Water Sector Resource Typing Guidance

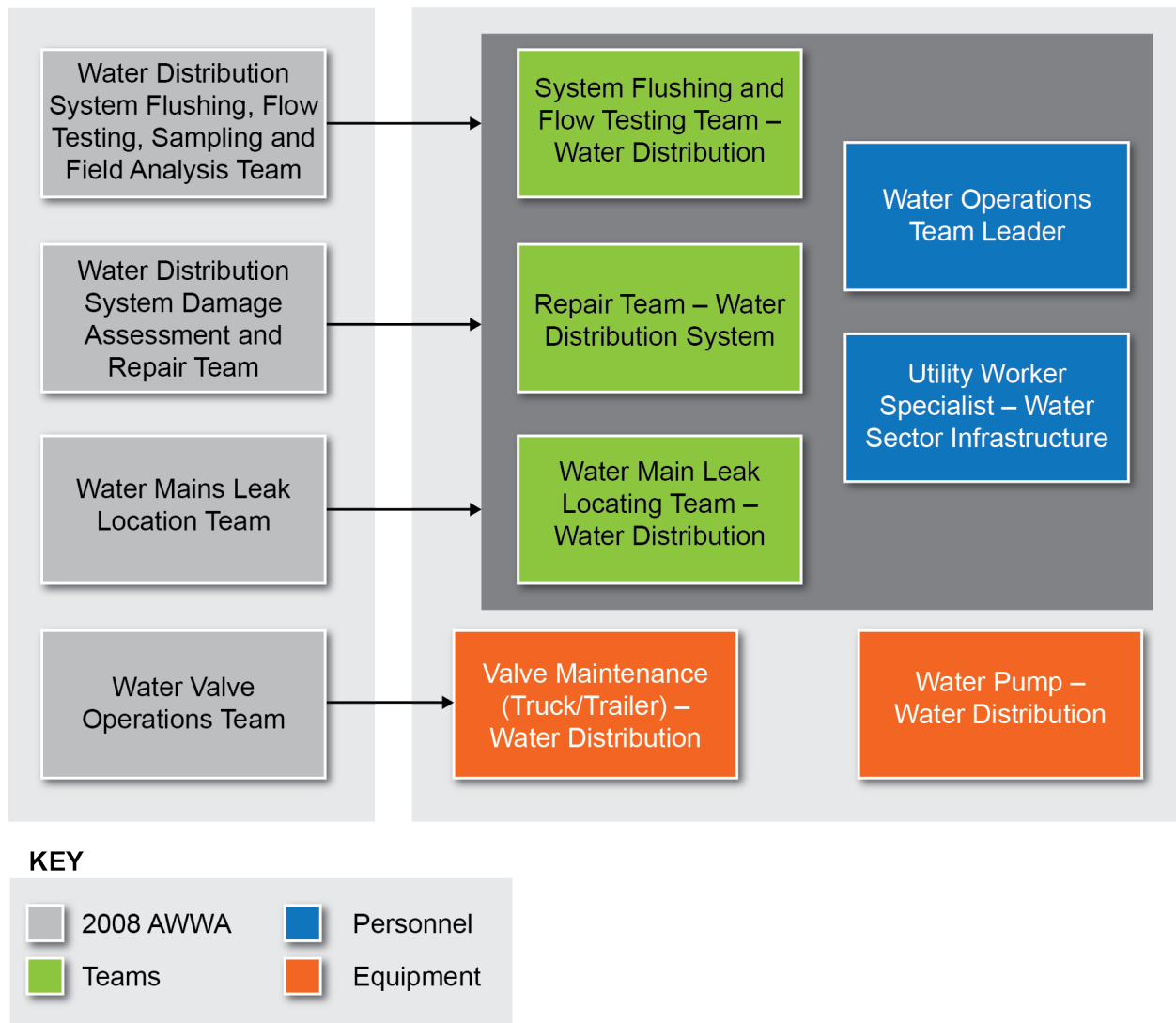
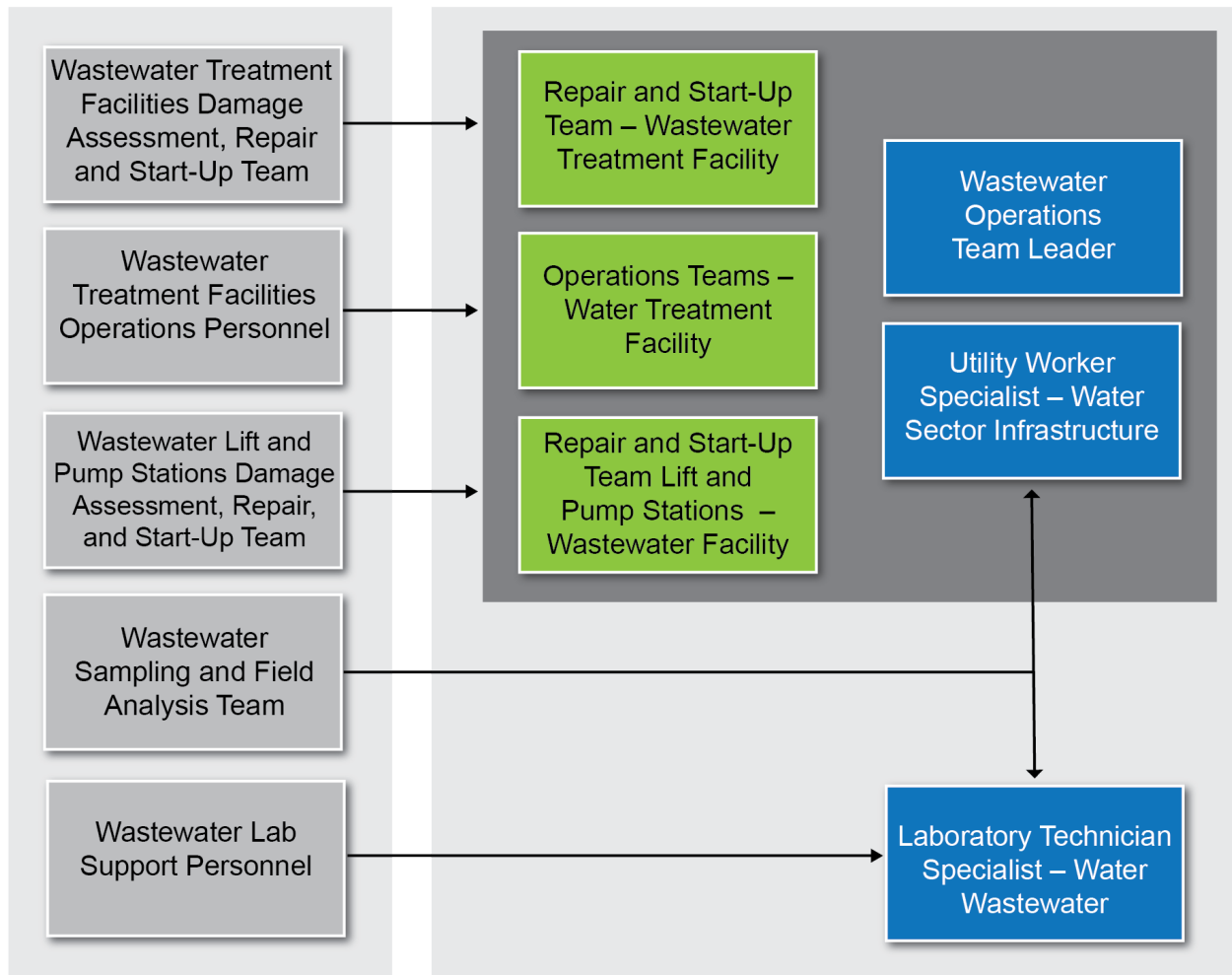


Figure 4. Wastewater Process

**2008 AWWA Water and
Wastewater Mutual Aid and
Assistance Resource
Typing Manual**

2019 Water Sector Resource Typing Guidance



KEY

2008 AWWA Personnel Teams

Figure 5. Wastewater Collection

**2008 AWWA Water and
Wastewater Mutual Aid and
Assistance Resource
Typing Manual**

2019 Water Sector Resource Typing Guidance

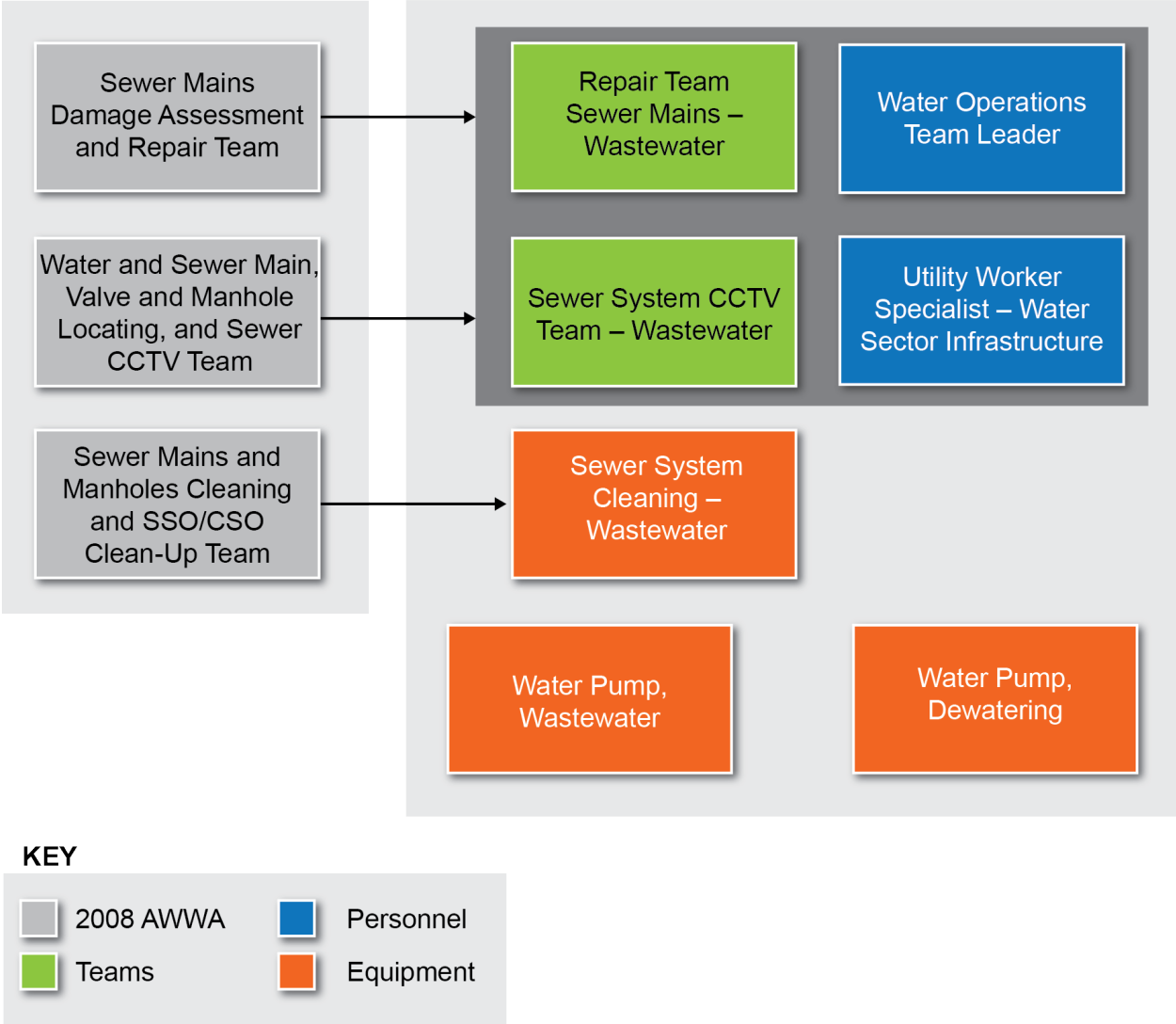


Figure 6. General Supporting Resources

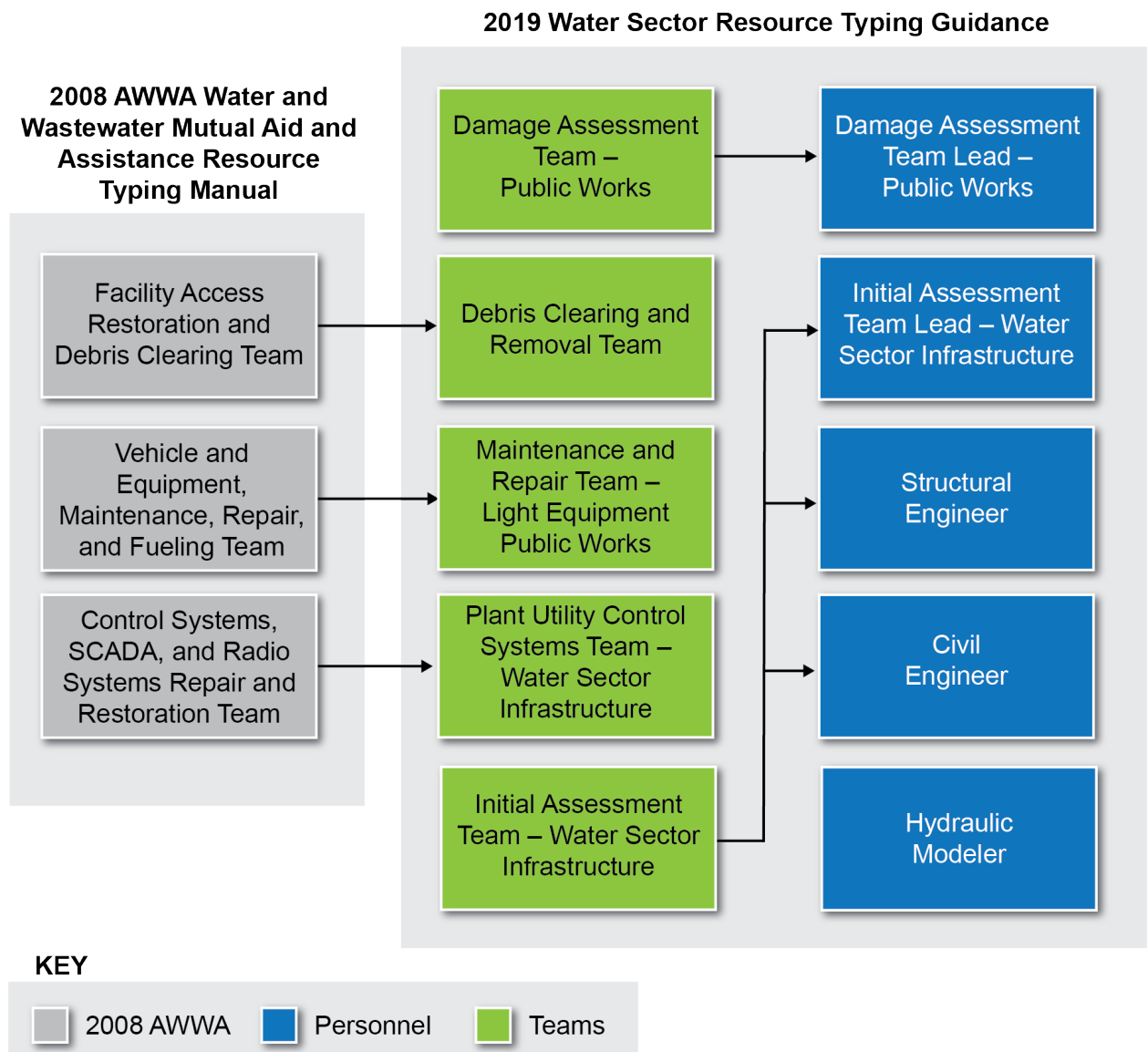
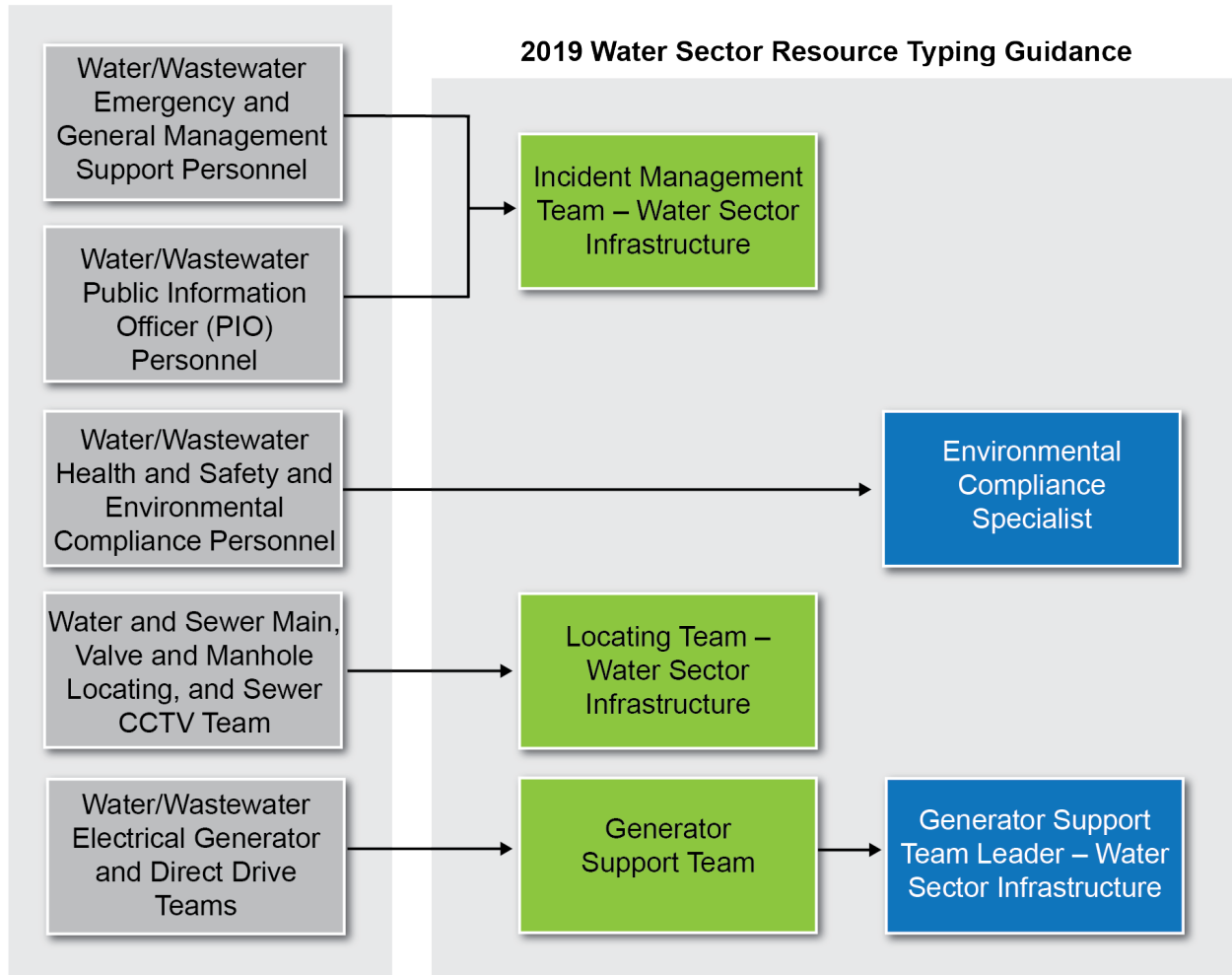


Figure 6. General Supporting Resources (continued)

**2008 AWWA Water and
Wastewater Mutual Aid and
Assistance Resource
Typing Manual**



KEY

2008 AWWA Personnel Teams

Attachment B: Personnel Resource Types

- Civil Engineer
- Damage Assessment Team Leader – Public Works
- Environmental Compliance Specialist – Water Sector Infrastructure
- Generator Support Team Lead – Water Sector Infrastructure
- Hydraulic Modeler
- Initial Assessment Team Leader – Water Sector Infrastructure
- Laboratory Technician Specialist – Water/Wastewater
- Structural Engineer
- Utility Worker Specialist – Water Sector Infrastructure
- Wastewater Operations Team Leader
- Water Operations Team Leader

CIVIL ENGINEER

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Civil Engineer: 1. Applies engineering principles and practices as it relates to design and implementation of Public Works projects. 2. Participates in project identification, project integration, cost estimating, construction inspection, and design and review of plans and specifications.
COMPOSITION AND ORDERING SPECIFICATIONS	1. This position can be ordered as a single resource 2. This position can be ordered as part of a National Incident Management System (NIMS) typed teams (Damage Assessment Team – Public Works, Initial Assessment Team – Water Sector Infrastructure) 3. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 4. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 5. Requestor specifies the type of structural engineering experience 6. Requestor specifies personal protective equipment (PPE) such as hard hats, reflective vests, eye protection, ear protection, and other equipment based on incident conditions 7. Requestor and provider discuss safety and working environment conditions prior to deployment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
DESCRIPTION	A Civil Engineer oversees, inspects, and assesses bridges, roadways, dams, and other civil structures within the impacted area and makes appropriate recommendations for repair	Not Specified
EDUCATION	Bachelor's degree in civil engineering	Not Specified
TRAINING	Completion of the following: 1. IS-100: Introduction to Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction	Not Specified
EXPERIENCE	Advanced knowledge in civil engineering and experience related to the request for deployment	Not Specified
PHYSICAL/MEDICAL FITNESS	1. Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate PPE	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

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CIVIL ENGINEER

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1 of 2

COMPONENT	SINGLE TYPE	NOTES
CURRENCY	Functions in this position during an incident, event, exercise, or simulation at least once every three years	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Professional Engineer (P.E.), as the state, tribe, or territory regulates	AHJ shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Damage Assessment Team – Public Works
2. FEMA, NIMS 508: Initial Assessment Team – Water Sector Infrastructure

DAMAGE ASSESSMENT TEAM LEADER – PUBLIC WORKS

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Damage Assessment Team Leader – Public Works supervises and manages overall team operations, damage assessment processes, and reports collected assessment data
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource 2. This position can be ordered as part of a National Incident Management System (NIMS) typed team (Damage Assessment Team) 3. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 4. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 5. Requestor and provider discuss safety and working environment conditions prior to deployment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
DESCRIPTION	<p>The Damage Assessment Team Leader – Public Works:</p> <ol style="list-style-type: none"> 1. Supervises overall team operations and assessment process 2. Assigns and delegates work to subordinates or team personnel 3. Manages and reports collected assessment data to Emergency Operations Center (EOC) 4. Works with response agencies to initiate documentation of all costs incurred subsequent to the emergency/disaster 5. Documents all damage and repairs already conducted, including appropriate photographs or video 6. Provides for submission of Initial Damage Assessment Reports to the requestor, Incident Commander (IC) and/or appropriate EOC 7. Promotes accuracy by clearly defining the information and documentation to be collected to assess damage and support requests for Stafford Act assistance. 8. Promotes consistency by standardizing the criteria used to assess damage to residential areas and offering clear guidance on assessing damage to infrastructure. 9. Promotes efficiency by empowering emergency management at all levels with the structure and information needed to streamline damage assessment efforts. 	Not Specified
EDUCATION	Not Specified	Requestor identifies certification level necessary to correctly assess damage.

COMPONENT	SINGLE TYPE	NOTES
TRAINING	<p>Completion of the following:</p> <ol style="list-style-type: none"> 1. IS-100: Introduction to the Incident Command System (ICS), ICS-100 2. IS-200: Incident Command System for Single Resource and Initial Action Incidents 3. ICS-300: Intermediate Incident Command System for Expanding Incidents 4. IS-700: National Incident Management System, An Introduction 5. IS-800: National Response Framework, An Introduction 6. IS-2900: National Disaster Recovery Framework (NDRF) Overview 7. IS-559: Local Damage Assessment 8. IS-1160: Damage Assessment Operations Training 9. G0191: ICS/EOC Interface 	Not Specified
EXPERIENCE	<p>Knowledge, Skills and Abilities:</p> <ol style="list-style-type: none"> 1. Comprehensive knowledge of the damage assessment process 2. Extensive knowledge of issues affecting life safety, critical infrastructure, and human needs, such as transportation infrastructure issues and public utility infrastructure issues 3. General knowledge of Geographic Information Systems (GIS) and GPS 4. Ability to use word processing, data management, finance, and scheduling software <p>Experience:</p> <ol style="list-style-type: none"> 1. Experience in an emergency management agency or public safety agency, or service commensurate with the mission assignment 2. Experience with cost tracking and reimbursement procedures 3. Experience with FEMA Damage Assessment documentation 	Not Specified
PHYSICAL/MEDICAL FITNESS	<ol style="list-style-type: none"> 1. Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate Personal Protective Equipment (PPE) 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
CURRENCY	Functions in this position during an incident, event, exercise, or simulation at least once every three years	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Not Specified	Authority Having Jurisdiction (AHJ) shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Damage Assessment Team – Public Works
2. FEMA, Damage Assessment Operations Manual, April 2016

ENVIRONMENTAL COMPLIANCE SPECIALIST – WATER SECTOR INFRASTRUCTURE

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Environmental Compliance Specialist – Water Sector Infrastructure provides environmental compliance support by applying knowledge of various water and wastewater principles, practices, and regulations to conduct inspections; monitor activities, plans, and sites for compliance; and compile various data and information under multiple types of regulatory frameworks
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource 2. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 3. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 4. Requestor specifies the potential environmental impact of the response 5. Requestor and provider discuss safety and working environment conditions prior to deployment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
DESCRIPTION	<p>The Environmental Compliance Specialist:</p> <ol style="list-style-type: none"> 1. Assesses and monitors impacts to various environmental rules and regulations based on operations 2. Recommends remedial actions to correct or mitigate environmental impact to air quality, water quality, wilderness, endangered wildlife, and other environmental factors 	Not Specified
EDUCATION	Bachelor's degree in biology, engineering, environmental science, geology, chemistry, Geographical Information Systems (GIS), or related field	Not Specified
TRAINING	<p>Completion of the following:</p> <ol style="list-style-type: none"> 1. IS-100: Introduction to Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction 	Not Specified
EXPERIENCE	<p>Environmental compliance specialist with experience in all facets of multi-media compliance under:</p> <ol style="list-style-type: none"> 1. 40 Code of Federal Regulations (CFR) Protection of the Environment, including the Resource Conservation and Recovery Act (RCRA), Clean Water Act (CWA), Clean Air Act (CAA), or Safe Drinking Water Act (SDWA) 2. 49 CFR (Department of Transportation (DOT) transportation requirements) 	Not Specified

COMPONENT	SINGLE TYPE	NOTES
	3. Maintenance or construction of water/wastewater systems, or related environmental activities in accordance with Environmental Protection Agency (EPA) standard methods	
PHYSICAL/MEDICAL FITNESS	1. Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate Personal Protective Equipment (PPE)	PPE is mission specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
CURRENCY	Functions in this position during an incident, event, exercise, or simulation at least once every three years Not Specified	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS		1. Professional or specialty certification/license may include Certified Hazardous Materials Manager (CHMM) or 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER). 2. Authority Having Jurisdiction (AHJ) shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

- 40 Code of Federal Regulations (CFR): Protection of the Environment, latest edition adopted
- Environmental Protection Agency (EPA), Resource Conservation and Recovery Act (RCRA)
- EPA, Clean Air Act (CAA), 1990
- EPA, Clean Water Act (CWA), November 2002
- EPA, Safe Drinking Water Act (SDWA), November 2002
- 49 CFR: Department of Transportation (DOT), latest edition adopted

GENERATOR SUPPORT TEAM LEAD – WATER SECTOR INFRASTRUCTURE

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Generator Support Team Lead – Water Sector Infrastructure: <ol style="list-style-type: none"> 1. Oversees the deployment, operations, maintenance, and rotation of deployed emergency support generators 2. Develops generator rotation plans to minimize requestor generator need
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource 2. This position can be ordered as part of a National Incident Management System (NIMS) typed team (Generator Support Team) 3. Requestor and Provider discuss logistics for this position, such as security, lodging, transportation, and meals, prior to deployment 4. The position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable up to 14 days 5. Requestor and Provider discuss safety and working environment conditions prior to deployment 6. Requestor may order this position may be ordered as a single resource to oversee and manage a group of Generator Support Teams

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
DESCRIPTION	The Generator Support Team Lead – Water Sector Infrastructure oversees the field teams responsible for the assessment, deployment, rotation, operation, fueling and maintenance of emergency power generators	Not Specified
EDUCATION	Not Specified	Not Specified
TRAINING	Completion of the following: <ol style="list-style-type: none"> 1. IS-100: Introduction to the Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction 	Not Specified
EXPERIENCE	Advanced knowledge of engines (such as gas, diesel, natural gas, propane), generators, variable frequency drive units, switchgear, and troubleshooting techniques.	Not Specified
PHYSICAL/MEDICAL FITNESS	<ol style="list-style-type: none"> 1. Performs duties under moderate circumstances characterized by working consecutive 12-hour shifts under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate Personal Protective Equipment (PPE) 	PPE is mission-specific and may vary by work environment; it includes protective footwear, arc flash protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
CURRENCY	Functions in this position during an operational incident, exercise, drill, or simulation at least once every three years	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Licensed Journeyman Electrician	<ol style="list-style-type: none"> 1. Requestor determines reciprocity or equivalency with the providing jurisdiction before deployment. 2. Identify jurisdiction specific transportation and environmental certifications or requirements, such as hazardous materials/fuel transport license endorsement.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. Generator Support Team Lead – Water Sector Infrastructure could be requested to conduct a generator assessment with the Initial Assessment Team.

REFERENCES

1. FEMA, NIMS 508: Generator Support Team
2. FEMA, NIMS 508: Initial Assessment Team – Water Sector
3. National Fire Protection Association 110, Standards for Emergency and Standby Power Systems
4. National Fire Protection Association 70E – Standard for Electric Safety in the Workplace

HYDRAULIC MODELER

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Hydraulic Modeler plans and models water, wastewater systems, stormwater, groundwater, or recycled water projects
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource or in conjunction with a National Incident Management System (NIMS) typed teams (Operations Team – Water Treatment Facilities, Operations Team – Wastewater Treatment, Repair and Startup Lift and Pump Stations Team – Wastewater, Repair and Startup Team Pump Stations – Water, Repair and Startup Team Water Distribution, Repair and Startup Team Water Treatment Facility – Water, Repair and Startup Team Wastewater Treatment Facility) 2. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 3. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 4. Requestor and provider discuss safety and working environment conditions prior to deployment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
DESCRIPTION	The Hydraulic Modeler plans and models water and wastewater systems related to gravity sanitary sewers and force mains; water distribution and transmission pipelines; and water and wastewater pump stations and uses Geographic Information Systems (GIS) to assist with planning response efforts	Not Specified
EDUCATION	Bachelor's degree in civil engineering, environmental engineering, or related field.	Not Specified
TRAINING	Completion of the following: <ol style="list-style-type: none"> 1. IS-100: Introduction to Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction 	Not Specified
EXPERIENCE	<ol style="list-style-type: none"> 1. Advanced knowledge of system hydraulics and hydraulic modeling software for pressurized and/or gravity pipeline networks. 2. Knowledge of and experience working with GIS. 	Requestor gives provider modeling software requirements.
PHYSICAL/MEDICAL FITNESS	<ol style="list-style-type: none"> 1. Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate Personal Protective Equipment (PPE) 	PPE is mission specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
CURRENCY	Functions in this position during an incident, event, exercise, or simulation at least once every three years.	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Not Specified	<ol style="list-style-type: none"> 1. AHJ to specify necessary licenses or certifications. 2. AHJ shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Operations Team – Water Treatment Facilities
2. FEMA, NIMS 508: Operations Team – Wastewater Treatment
3. FEMA, NIMS 508: Repair and Startup Lift and Pump Stations Team – Wastewater
4. FEMA, NIMS 508: Repair and Startup Team Pump Stations – Water
5. FEMA, NIMS 508: Repair and Startup Team Water Distribution
6. FEMA, NIMS 508: Repair and Startup Team Water Treatment Facility – Water
7. FEMA, NIMS 508: Repair and Startup Team Wastewater Treatment Facility

INITIAL ASSESSMENT TEAM LEADER – WATER SECTOR INFRASTRUCTURE

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Initial Needs Assessment Team Leader – Water Sector Infrastructure supervises and manages overall team operations and assessment processes, and reports collected assessment data
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource or in conjunction with a National Incident Management System (NIMS) typed team (Initial Assessment Team – Water Sector Infrastructure) 2. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 3. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 4. Requestor specifies personal protective equipment (PPE) such as hard hats, reflective vests, eye protection, ear protection, and other equipment based on incident conditions 5. Discuss safety and working environment conditions prior to deployment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
DESCRIPTION	<p>The Initial Assessment Team Leader – Water Sector Infrastructure:</p> <ol style="list-style-type: none"> 1. Supervises overall team operations and assessment processes 2. Disseminates technical information regarding RNA activities 3. Assigns and delegates work to subordinates or team personnel 4. Manages and reports collected assessment data 5. Prepares documentation necessary for continuing response operations 	Not Specified
EDUCATION	Not Specified	Not Specified
TRAINING	<p>Completion of the following:</p> <ol style="list-style-type: none"> 1. IS-100: Introduction to the Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resource and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction 5. IS-559: Local Damage Assessment 6. IS-1160: Damage Assessment Operations Training 	Not Specified

COMPONENT	SINGLE TYPE	NOTES
EXPERIENCE	<p>Initial Assessment Team Leader Knowledge, Skills and Abilities:</p> <ol style="list-style-type: none"> 1. Comprehensive knowledge of the RNA process and the infrastructure under assessment 2. General knowledge of Geographic Information Systems (GIS) and global positioning system GPS 3. Supervisory experience in water/wastewater agency or service commensurate with the mission assignment <p>Experience:</p> <ol style="list-style-type: none"> 1. Experience working on rapids needs assessment teams 2. Supervisory experience in water/wastewater agency or service commensurate with the mission assignment 	Not Specified
PHYSICAL/MEDICAL FITNESS	Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time	Not Specified
CURRENCY	Functions in this position during an operational incident, exercise, drill, or simulation at least once every three years	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Not Specified	Authority Having Jurisdiction (AHJ) shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Initial Assessment Team – Water Sector Infrastructure
2. FEMA, National Incident Management System (NIMS), October 2017
3. FEMA, NIMS Guideline for the National Qualification System (NQS), November 2017
4. FEMA, National Response Framework, June 2016
5. FEMA, Damage Assessment Operations Manual, April 2016

LABORATORY TECHNICIAN SPECIALIST – WATER/WASTEWATER

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Laboratory Technician Specialist – Water/Wastewater performs water and wastewater sampling, testing and analysis
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource 2. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 3. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 4. Requestor specifies personal protective equipment (PPE) such as hard hats, reflective vests, eye protection, ear protection, and other equipment based on incident conditions 5. Requestor and provider discuss safety and working environment conditions prior to deployment 6. Water/Wastewater may be responsible for field sampling as well as analysis depending on AHJ needs.

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	NOTES
DESCRIPTION	Same as Type 2. PLUS: <ol style="list-style-type: none"> 1. Performs chemical analyses to determine pH, conductivity, turbidity, solids, acidity, alkalinity, volatile acids, demand, ammonia, total Kjeldahl nitrogen, total phosphorus, oil and grease, cyanide, chlorophyll, phenolics, metals, residual chlorine, color, odor, and microbiological analyses 2. Determines total and fecal coliform and Microtox or organic and metals preparatory procedures in accordance with standard operating procedures 3. Calibrates, operates, and maintains test equipment to perform analyses 	The Laboratory Technician Specialist; <ol style="list-style-type: none"> 1. Is capable of analysis of water and wastewater samples for water quality determination 2. Performs basic laboratory testing and analysis functions including preparing samples and performing chemical and bacteriological analyses that require basic laboratory skills 3. Serves as sample custodian to log, verify, and confirm preservation of samples 4. Performs analyses, including required quality control 	Not Specified
EDUCATION	Same as Type 2. PLUS: Experience performing chemical and biological laboratory analysis and testing	Experience in conducting water and wastewater testing under controlled laboratory conditions	Not Specified
TRAINING	Same as Type 2	Completion of the following: <ol style="list-style-type: none"> 1. IS-100: Introduction to Incident Command System, ICS-100 	Not Specified

COMPONENT	TYPE 1	TYPE 2	NOTES
		2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. S-800: National Response Framework, An Introduction	
EXPERIENCE	Same as Type 2, PLUS: Two years of experience in laboratory testing and analysis	Knowledge of water and wastewater laboratory testing	Not specified.
PHYSICAL/MEDICAL FITNESS	Same as Type 2	1. Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate PPE	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
CURRENCY	Same as Type 2	Functions in this position during an incident, event, exercise, or simulation at least once every three years	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Certification as a Registered Environmental Laboratory Technologist	Not Specified	1. Authority Having Jurisdiction (AHJ) to specify necessary licenses or certifications. 2. AHJ shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

None

STRUCTURAL ENGINEER

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	Applies engineering principles and practices to provide engineering direction/recommendations to solve complex water and wastewater problems
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource 2. This position can be ordered as part of a National Incident Management System (NIMS) typed teams (Damage Assessment Team – Public Works, Initial Assessment Team – Water Sector Infrastructure) 3. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 4. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 5. Requestor specifies the type of structural engineering specialty for the need 6. Requestor specifies personal protective equipment (PPE) such as hard hats, reflective vests, eye protection, ear protection, and other equipment based on incident conditions 7. Requestor and provider discuss safety and working environment conditions prior to deployment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
DESCRIPTION	A Structural Engineer oversees, inspects, and assesses impacted structures, and makes appropriate recommendations.	Not Specified
EDUCATION	Bachelor's degree in civil engineering or architecture with a specialized structural emphasis	Not Specified
TRAINING	Completion of the following: <ol style="list-style-type: none"> 1. IS-100: Introduction to Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction 	Not Specified
EXPERIENCE	Advanced knowledge in structural engineering of public and private infrastructure related to the request for deployment	Not Specified
PHYSICAL/MEDICAL FITNESS	<ol style="list-style-type: none"> 1. Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate PPE 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
CURRENCY	Functions in this position during an incident, event, exercise, or simulation at least once every three years	Not Specified

DRAFT – INTERIM GUIDANCE – DRAFT
STRUCTURAL ENGINEER

JUNE 2019

1 of 2

COMPONENT	SINGLE TYPE	NOTES
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Professional Engineer (P.E.), as the state, tribe, or territory regulates	AHJ shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Damage Assessment Team – Public Works
2. FEMA, NIMS 508: Initial Assessment Team – Water Sector Infrastructure

UTILITY WORKER SPECIALIST – WATER SECTOR INFRASTRUCTURE

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Utility Worker Specialist – Water Sector Infrastructure supports the repair, restoration, and operation of water/wastewater infrastructure systems and facilities
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource 2. This position can be ordered as part of a National Incident Management System (NIMS) typed teams (Operations Team – Water Treatment, Operations Team – Wastewater Treatment, Plant Utility Control System Team – Water Sector Infrastructure, Repair and Startup Lift and Pump Stations Team – Wastewater, Repair and Startup Team Pump Stations – Water, Repair and Startup Team Water Distribution, Repair and Startup Team Water Treatment Facility – Water, Repair and Startup Team Wastewater Treatment Facility, Repair Team Sewer Mains – Wastewater, Sewer System Closed Circuit Television (CCTV) Team – Wastewater, System Flushing and Flow Testing Team – Water Distribution, Water Main Leak Locating Team – Water Distribution 3. Requestor and provider discuss logistics for this position, such as security, lodging, transportation, and meals, prior to deployment 4. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable up to 14 days 5. Requestor specifies the types of skills necessary such as mechanic (engine, pump, or machinist), electrician, welder, repair technician (distribution, production, collections, treatment, or radio), and field sampling and/or other water/wastewater specific skills 6. Requestor and provider discuss safety and working environment conditions prior to deployment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
DESCRIPTION	The Utility Worker Specialist – Water Sector Infrastructure supports the repair, restoration, and operation of water/wastewater facilities and systems	Not Specified
EDUCATION	Not Specified	Not Specified
TRAINING	Completion of the following: <ol style="list-style-type: none"> 1. IS-100: Introduction to the Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction 	Not Specified
EXPERIENCE	<ol style="list-style-type: none"> 1. Knowledge of water/wastewater system operations 2. Knowledge of operating characteristics and safety procedures for equipment being operated 3. Knowledge of materials, tools, and equipment typically used in maintenance or construction 	Authority Having Jurisdiction (AHJ) will determine the experience level required based on response needs.

COMPONENT	SINGLE TYPE	NOTES
PHYSICAL/MEDICAL FITNESS	4. Knowledge of hazards and safety measures as they apply to the type of work being performed	
	1. Performs duties under demanding circumstances characterized by working consecutive 12-hour shifts under physical and emotional stress for sustained periods of time	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
	2. Is able to work while wearing appropriate PPE	
CURRENCY	3. Is able to lift and carry up to 50 pounds frequently	
	Functions in this position during an incident, event, exercise, or simulation at least once every three years	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Not Specified	1. AHJ specifies the level of distribution or treatment certification needed within their State for the requested assignment by the skillset (operator certification, journeyman, Automotive Service Excellence (ASE) certified mechanics, electrician's license). 2. Authority Having Jurisdiction (AHJ) shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability

REFERENCES

1. FEMA, NIMS 508: Operations Team – Water Treatment
2. FEMA, NIMS 508: Operations Team – Wastewater Treatment
3. FEMA, NIMS 508: Plant Utility Control System Team – Water Sector Infrastructure
4. FEMA, NIMS 508: Repair and Startup Lift and Pump Stations Team – Wastewater
5. FEMA, NIMS 508: Repair and Startup Team Pump Stations – Water
6. FEMA, NIMS 508: Repair and Startup Team Water Distribution
7. FEMA, NIMS 508: Repair and Startup Team Water Treatment Facility – Water
8. FEMA, NIMS 508: Repair and Startup Team Wastewater Treatment Facility
9. FEMA, NIMS 508: Repair Team Sewer Mains – Wastewater
10. FEMA, NIMS 508: Sewer System Closed Circuit Television (CCTV) Team – Wastewater
11. FEMA, NIMS 508: System Flushing and Flow Testing Team – Water Distribution
12. FEMA, NIMS 508: Water Main Leak Locating Team – Water Distribution

WASTEWATER OPERATIONS TEAM LEADER

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Wastewater Operations Team Leader directs and manages the repair, restoration, and operations of wastewater infrastructure systems and facilities
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource 2. This position can be ordered as part of a National Incident Management System (NIMS) typed team (Operations Team – Wastewater Treatment, Plant Utility Control System Team – Water Sector Infrastructure, Repair and Startup Lift and Pump Stations Team – Wastewater, Repair and Startup Team Wastewater Treatment Facility, Repair Team Sewer Mains – Wastewater, Sewer System Closed Circuit Television (CCTV) Team – Wastewater) 3. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 4. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 5. Requestor specifies the type of wastewater operations skills necessary such as treatment or collections 6. Requestor and provider discuss safety and working environment conditions prior to deployment 7. Requestor specifies water source and type, and any specialized certifications necessary such as Hazard Waste Operations and Emergency Response (HAZWOPER) or Operator Certifications 8. Requestor specifies personal protective equipment (PPE) such as hard hats, reflective vests, eye protection, ear protection, and other equipment based on incident conditions

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	NOTES
DESCRIPTION	<p>Same as Type 2, PLUS:</p> <ol style="list-style-type: none"> 1. Manages and oversees a group of wastewater treatment facilities including staff rotations, facilitating supply requests, and additional relevant resources 2. Oversees response operations for groups of repair and start-up teams including staff rotations, prioritizing repair needs, facilitating supply requests, and additional relevant resources 3. Communicates with the established command structure and Emergency Operations Center (EOC) as necessary. 	The Wastewater Operations Team Leader directs and manages wastewater infrastructure facilities, including primary and secondary treatment operations and lift and pump stations	Not Specified
EDUCATION	Not Specified	Not Specified	Not Specified

COMPONENT	TYPE 1	TYPE 2	NOTES
TRAINING	Same as Type 2, PLUS: Completion of the following: 1. ICS-300: Intermediate Incident Command System for Expanding Incidents 2. ICS 400: Advanced Incident Command System Command and General Staff-Complex Incidents	Completion of the following: 1. IS-100: Introduction to the Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction	Not Specified
EXPERIENCE	Same as Type 2, PLUS: Demonstrated operational leadership experience in wastewater operations	Advanced knowledge of wastewater operations	Not Specified
PHYSICAL/MEDICAL FITNESS	Same as Type 2	1. Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate PPE	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
CURRENCY	Same as Type 2	Functions in this position during an incident, event, exercise, or simulation at least once every three years.	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Same as Type 2	Not Specified	1. Certification varies from state to state; AHJ specifies the level of distribution or treatment certification needed within their State for the requested assignment. 2. AHJ shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Operations Team – Wastewater Treatment
2. FEMA, NIMS 508: Plant Utility Control System Team – Water Sector Infrastructure
3. FEMA, NIMS 508: Repair and Startup Lift and Pump Stations Team – Wastewater
4. FEMA, NIMS 508: Repair and Startup Team Wastewater Treatment Facility
5. FEMA, NIMS 508: Repair Team Sewer Mains – Wastewater
6. FEMA, NIMS 508: Sewer System Closed Circuit Television (CCTV) Team – Wastewater

WATER OPERATIONS TEAM LEADER

RESOURCE CATEGORY	Public Works
RESOURCE KIND	Personnel
OVERALL FUNCTION	The Water Operations Team Leader directs and manages the repair, restoration, and operations of water infrastructure systems and facilities
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. This position can be ordered as a single resource 2. This position can be ordered as part of a National Incident Management System (NIMS) typed team (Operations Team – Water Treatment, Plant Utility Control System Team – Water Sector Infrastructure, Repair and Startup Team Pump Stations – Water, Repair Team – Water Distribution, Repair and Startup Team – Water Treatment Facility, System Flushing and Flow Testing Team – Water Distribution, Water Main Leak Locating Team – Water Distribution) 3. Requestor and provider discuss logistics for deploying this position, such as security, lodging, transportation, and meals, prior to deployment 4. This position typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 5. Requestor specifies the type of water operations skills necessary such as production or distribution 6. Requestor and provider discuss safety and working environment conditions prior to deployment 7. Requestor specifies water source and type, and any specialized certifications necessary, such as Hazardous Waste Operations and Emergency Response (HAZWOPER) and/or Operator Certifications 8. Requestor specifies personal protective equipment (PPE) such as hard hats, reflective vests, eye protection, ear protection, and other equipment based on incident conditions.

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	NOTES
DESCRIPTION	<p>Same as Type 2, PLUS:</p> <ol style="list-style-type: none"> 1. Manages and oversees a group of water treatment and distribution facilities including staff rotations, facilitating supply requests, and additional relevant resources 2. Oversees response operations for groups of repair and start-up teams including staff rotations, prioritizing repair needs, facilitating supply requests, and additional relevant resources 3. Communicates with the established command structure and Emergency Operations Center (EOC) as necessary 	The Water Operations Team Leader operates and maintains water infrastructure facilities and can direct and supervise the work of other operators	Not Specified
EDUCATION	Not Specified	Not Specified	Not Specified

COMPONENT	TYPE 1	TYPE 2	NOTES
TRAINING	Same as Type 2, PLUS: Completion of the following: 1. ICS-300: Intermediate Incident Command System for Expanding Incidents 2. ICS 400: Advanced Incident Command System Command and General Staff-Complex Incidents	Completion of the following: 1. IS-100: Introduction to the Incident Command System, ICS-100 2. IS-200: Incident Command System for Single Resources and Initial Action Incidents 3. IS-700: National Incident Management System, An Introduction 4. IS-800: National Response Framework, An Introduction	Not Specified
EXPERIENCE	Same as Type 2, PLUS: Demonstrated operational leadership experience in water operations	Advanced knowledge of water operations	Authority Having Jurisdiction (AHJ) will determine the experience level required based on response needs.
PHYSICAL/MEDICAL FITNESS	Same as Type 2	1. Performs duties under moderate circumstances characterized by working consecutive 12-hour days under physical and emotional stress for sustained periods of time 2. Is able to work while wearing appropriate PPE	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
CURRENCY	Same as Type 2	Functions in this position during an incident, event, exercise, or simulation at least once every 3 years	Not Specified
PROFESSIONAL AND TECHNICAL LICENSES AND CERTIFICATIONS	Same as Type 2	Not Specified	1. Certification varies from state to state; AHJ specifies the level of distribution or treatment certification needed within their State for the requested assignment. 2. AHJ shall determine reciprocity or equivalency with the providing jurisdiction before deployment.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Operations Team – Water Treatment
2. FEMA, NIMS 508: Plant Utility Control System Team – Water Sector Infrastructure
3. FEMA, NIMS 508: Repair and Startup Team Pump Stations – Water Sector
4. FEMA, NIMS 508: Repair Team – Water Distribution
5. FEMA, NIMS 508: Repair and Startup Team – Water Treatment Facility
6. FEMA, NIMS 508: System Flushing and Flow Testing Team – Water Distribution
7. FEMA, NIMS 508: Water Main Leak Locating Team – Water Distribution

Attachment C: Team Resource Types

- Damage Assessment Team – Public Works
- Debris Clearing and Removal Team – Public Works
- Generator Support Team
- Incident Management Team – Water Sector Infrastructure
- Initial Assessment Team – Water Sector Infrastructure
- Locating Team – Water Sector Infrastructure
- Maintenance and Repair Team – Light Equipment Public Works
- Operations Team – Wastewater Treatment Facility
- Operations Team – Wastewater Treatment Facility
- Plant Utility Control Systems Team – Water Sector Infrastructure
- Repair and Start-Up Team – Wastewater Treatment Facility
- Repair and Start-Up Team – Water Treatment Facility
- Repair and Start-Up Team Lift and Pump Stations – Wastewater
- Repair and Start-Up Team Water Pump Facilities – Water Production
- Repair Team – Water Distribution System
- Repair Team Sewer Mains – Wastewater
- Sewer System Closed Circuit Television Team – Wastewater
- System Flushing and Flow Testing Team – Water Distribution
- Water Main Leak Locating Team – Water Distribution

DAMAGE ASSESSMENT TEAM – PUBLIC WORKS

DESCRIPTION	Damage Assessment Team – Public Works assesses the magnitude of damage an incident has caused to public infrastructures such as facilities, roadways, bridges, piping systems, and water sector facilities
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	<ol style="list-style-type: none"> 1. Receives initial damage reports from the Rapid Needs Assessment (RNA) Team 2. Coordinates with incident command, Emergency Operations Center (EOC), and other operational elements to identify and prioritize areas needing assessment 3. Documents and records observations with photo or video 4. Estimates disaster damage for magnitude and monetary value, utilizing appropriate documentation 5. Coordinates with Authority Having Jurisdiction (AHJ) regarding necessary repairs and for cost recovery of repairs 6. Provides damage reports to the requestor
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor specifies any specialty areas necessary for assessment, such as structural or bridge-related experience or water sector processes 4. Requestor may order specialists in other disciplines to assess specific damage based on incident needs, including building safety, geological survey, environmental, and public health 5. Requestor specifies any mission-specific supporting resources as necessary 6. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 7. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	3	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Damage Assessment Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	2 – Support Personnel	Support Personnel, at the Damage Assessment Team Lead's discretion, may include: <ol style="list-style-type: none"> 1. NIMS Type 1 Utility Worker Specialist 2. NIMS Type 1 Water Operations Team Leader 3. NIMS Type 1 Wastewater Operations Team Leader 4. NIMS Type 1 Civil Engineer 5. NIMS Type 1 Structural Engineer

COMPONENT	SINGLE TYPE	NOTES
SPECIALIZED EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Damage assessment forms 2. ATC-20 guide and supplies 3. Measuring devices 4. Basic first aid kit 5. Portable generator 6. Binoculars 7. Cutting/trimming device 8. Standard office supplies 9. Map of water infrastructure assets 10. Flashlights and spotlights 	Equipment includes a full complement of industry specific tools necessary for the assessment indicated within the function.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<ol style="list-style-type: none"> 1. Hard hat 2. Reflective vest 3. Gloves 4. Protective clothing 5. Protective footwear 	PPE is mission-specific and may vary by work environment; may include protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, masks, and confined space entry provisions.
ELECTRONICS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software 	<ol style="list-style-type: none"> 1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as needed based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Cell phone 2. Portable radio 	<ol style="list-style-type: none"> 1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Radio specifications must be provided by the requestor. 3. Relevant chargers and back-up batteries must be included with battery powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. Water sector infrastructure can include facilities such as: water/wastewater treatment plants and processes, distribution systems, collection systems, aquifers, reservoirs, dams, levees, tanks, wells, pump/lift/booster stations, control systems, floodwalls, and administrative buildings.
3. Support team personnel may require confined space entry training and provisions.

REFERENCES

1. FEMA, NIMS 508: Initial Assessment Team – Water Sector Infrastructure
2. FEMA, NIMS 509: Civil Engineer

JUNE 2019

DRAFT – INTERIM GUIDANCE – DRAFT
DAMAGE ASSESSMENT TEAM – PUBLIC WORKS

2 of 3

3. FEMA, NIMS 509: Damage Assessment Team Leader
4. FEMA, NIMS 509: Incident Commander (National Qualification System [NQS])
5. FEMA, NIMS 509: Initial Assessment Team Leader – Water Sector Infrastructure
6. FEMA, NIMS 509: Structural Engineer
7. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
8. FEMA, NIMS 509: Wastewater Operations Team Leader
9. FEMA, NIMS 509: Water Operations Team Leader
10. FEMA, Damage Assessment Operations Manual, April 2016

DEBRIS CLEARING AND REMOVAL TEAM – PUBLIC WORKS

DESCRIPTION	Debris Clearing and Removal Team – Public Works supplies all equipment for debris removal, trains employees on right-of-entry and debris removal, and removes debris as quickly as possible following the local Authority Having Jurisdiction (AHJ) Debris Management Plan
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	Debris Clearing and Removal Team – Public Works clears debris from vehicle path, removes debris from affected areas, and transports debris for proper disposal following the local plan
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor specifies any specialty loading equipment necessary based on incident needs 4. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	NOTES
MINIMUM PERSONNEL PER TEAM	5	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Debris Field Supervisor	Not Specified
SUPPORT PERSONNEL PER TEAM	1 – NIMS Type 1 Debris Training and Safety Officer 3 – Equipment Operator/Hauler	<ol style="list-style-type: none"> 1. This team must be aware of and familiar with procedures for special considerations, such as energized or hazardous utilities, environmental compliance, historic and archeological preservation, valuables/personal property, hazardous materials, animal carcasses, human remains, and crime scene evidence. 2. General laborers and administrative support staff can supplement this team as necessary. 3. Equipment Operator/Hauler is not a NIMS typed position.
SPECIALIZED EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. 1 – Lowboy 2. 2 – Wheel Loader 3. 3 – Tandem dump truck 4. 1 – Grapppler truck 5. 1 – Tub grinder 6. 1 – Tracked Excavator 7. Chainsaws 	<ol style="list-style-type: none"> 1. Hand tools include wire cutters, branch clippers, hand saws, screwdrivers, and shovels. 2. Power tools include chainsaws, pole saws, winches, reciprocating saw, and portable power source. 3. Measuring devices such as tape and wheel measurers. 4. Equipment may include additional specialty loading equipment based on incident needs.

COMPONENT	TYPE 1	NOTES
	8. Various hand tools	
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	PPE is mission-specific and may include: 1. Reflective vest 2. Gloves 3. Protective clothing 4. Protective footwear 5. Hard hat 6. Protective shield 7. Respiratory protection 8. Hearing protection 9. Basic first aid kit	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software	1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as needed based on ordering specifications
COMMUNICATIONS EQUIPMENT PER TEAM	1. Cell phone 2. Portable radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Radio specifications must be provided by the requestor. 3. Relevant chargers and back-up batteries must be included with batter powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Debris Assessment Team
2. FEMA, NIMS 508: Debris Monitoring Team
3. FEMA, NIMS 509: Debris Field Supervisor
4. FEMA, NIMS 509: Debris Training and Safety Officer
5. FEMA, Public Assistance Program and Policy Guide (PAPPG) V2, April 2017
6. Federal Highway Administration (FHWA) Emergency Relief Manual, May 2013
7. Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) Part 1910.132: Personal Protective Equipment, latest edition adopted

GENERATOR SUPPORT TEAM

DESCRIPTION	The Generator Support Team manages the deployment, rotation, operation, fueling, and maintenance of emergency power generators
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	This team assesses, deploys, rotates, operates, fuels, maintains, and provides essential supplies for continual operations of emergency generators
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor identifies supporting resources based on mission requirements 4. Requestor provides information for facilities and equipment requiring emergency power such as generator connections, fuel type, and demand load 5. Requestor provides any facility design and layout specifications to support the placement of the generator 6. Requestor specifies if material handling equipment (MHE) is necessary to unload generators from transport vehicles and load for deployment such as a 10-ton crane or forklift 7. Requestor coordinates with provider to develop refueling plan 8. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable device 9. Requestor specifies any necessary safety qualifications and equipment 10. Provider supplies all tools and material necessary for the connectivity, operations, fueling, and maintenance of deployed generators 11. Provider is responsible for transport of generators, which requires vehicles capable of pulling trailers and tow hitches of various sizes 12. Provider has provisions for minor spills, such as fuel or oil spill kits. 13. Requestor identifies jurisdiction specific transportation and environmental certifications or requirements, such as hazardous materials/fuel transport license endorsement

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	2	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Generator Support Team Leader – Water Sector Infrastructure	Not Specified
SUPPORT PERSONNEL PER TEAM	1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	<ol style="list-style-type: none"> 1. NIMS Utility Worker Specialist – Water Sector Infrastructure is a Licensed Journeyman Electrician, Apprentice, equivalent, or have significant experience with generator operations.

COMPONENT	SINGLE TYPE	NOTES
		<ol style="list-style-type: none"> 2. NIMS Utility Worker Specialist – Water Sector Infrastructure has familiarity with multiple generator fuel sources and capability to connect or refuel generators 3. Requestor identifies jurisdiction specific transportation and environmental certifications or requirements, such as hazardous materials/fuel transport license endorsement.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<p>PPE is mission-specific and may include:</p> <ol style="list-style-type: none"> 1. Electric-rated hard hat 2. Reflective vests 3. Gloves 4. Protective clothing 5. Protective footwear 	PPE is mission-specific and may vary by work environment; may include protective footwear, arc flash-rated protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software 	<ol style="list-style-type: none"> 1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as needed based on ordering specifications
COMMUNICATIONS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Cell phone 2. Portable radio 	<ol style="list-style-type: none"> 1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries must be included with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 509: Generator Support Team Leader – Water Sector Infrastructure
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
3. National Fire Protection Association 110, Standards for Emergency and Standby Power Systems, 2019

INCIDENT MANAGEMENT TEAM – WATER SECTOR INFRASTRUCTURE

DESCRIPTION	The Incident Management Team – Water Sector Infrastructure provides incident management or support during incidents or events in the field or Emergency Operations Center (EOC) that exceed a jurisdiction's or agency's capability or capacity. Teams may include members of Federal, state, local, tribal, and territorial entities; Nongovernmental Organizations (NGO); and private sector organizations. Teams encompass various agencies and jurisdictions.
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	<ol style="list-style-type: none"> 1. Deploys to manage or support emergency responses, incidents, or planned events requiring a higher capability or capacity level than the requesting jurisdiction or organization can provide 2. Assists with incident management and coordination activities during all-hazards events, including natural and human-caused events, as well as planned events 3. Assumes management and coordination of the incident for the requestor or supports a local Incident Command (IC) Unified Command (UC), or EOC and its IMT in managing an incident or event 4. Directs, tracks, and coordinates resources that the requestor and other supporting and responding organizations provide 5. Fulfills Command, Operations, Planning, Logistics, Finance/Administration, Safety, Public Information, and Liaison positions and functions, as the incident requires 6. Coordinates with requestor Emergency Operations Center (EOC) personnel, IC/UC, Authority Having Jurisdiction (AHJ), and Agency Administrators regarding incident management objectives and support
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Discuss duration of the deployment; typical deployments last up to 14 days, not including travel 4. Requestor conducts an incident complexity analysis and discusses the results with the provider to identify necessary levels of support; typical incident complexity factors include: <ol style="list-style-type: none"> a. Threat to life, property, and the environment b. Extent or severity of damage or harm c. Need for 24-hour staffing d. Length of expected deployment periods e. Impact to the population f. Geographic extent of the incident g. Organizational complexity and number of jurisdictions involved h. Availability of resources i. Political, social, and economic sensitivities j. Level of public and media attention 5. Specify available facilities for establishing an Incident Command Post (ICP) or EOC, including their proximity to the incident 6. Discuss team relief or replacement, as well as team member overlap to allow for smooth operational transition and transfer of command 7. Has short- and long-term configurations; long-term configurations include additional positions and capabilities to meet an incident's needs based on results of a complexity analysis

DRAFT – INTERIM GUIDANCE – DRAFT

JUNE 2019

INCIDENT MANAGEMENT TEAM – WATER SECTOR INFRASTRUCTURE

1 of 6

8. Discuss the need for specialty capabilities, such as effective response to water sector concerns, extended power outages, hazardous materials, law enforcement events, structural fire, or wildland fire
9. Specify staffing and equipment needs based on the complexity of the incident, such as the need for deputies and assistants, water sector typed teams and personnel, or the need to provide 24-hour coverage
10. Requestor and Provider discuss IMT responsibilities and authority throughout the incident, including if provider is supporting/augmenting requestor or leading the incident, in which case appropriate delegations of authority are required based on responsibilities assigned
11. An IMT working outside of its sponsoring entity's authority may need authorization from the requesting jurisdiction or agency, such as a Delegation of Authority, Financial Spending Authority, Letter of Direction, or Mission Assignment
12. Requestor and Provider discuss existing command structure, EOC structures and other coordinating entities, such as Federal, state, tribal, territorial, and local governments; Multiagency Coordination (MAC Group); and Joint Information System (JIS)
13. As an incident grows geographically and in number of jurisdictions, the IMT must ensure that appropriate authorizations are in place, such as a Delegation of Authority from a regional or state entity
14. An all-hazards IMT may be a multidisciplinary group representing water sector, law enforcement, public health and medicine, fire, Emergency Medical Services (EMS), urban search and rescue, and other fields
15. Requestors are to consider ordering the closest available resource to manage expanding incidents until a more qualified and capable resource is available
16. Team may also provide a transition from the response to recovery phase
17. Requestor and Provider discuss tactical capabilities available through the Requestor, such as hazardous materials response or technical rescue teams, and order these resources separately if not available
18. Requestor and Provider discuss the need for additional personnel or capabilities such as water sector specific personnel, locators, hydrogeologists, water treatment operators, laboratory personnel, Geographic Information Systems (GIS) specialists or analysts, staging area managers, fatality management personnel, or other technical specialists
19. Requestor and Provider discuss the need to include technical specialists on the team
20. Requestor and Provider discuss the process and expectations for: water quality sample documentation, effluent permit limit documentation, drinking water and sewage overflow public notification requirements, regulatory authority reporting, resource management; tracking and managing personnel hours; ensuring adequate personnel accountability; ensuring personnel safety and welfare; managing contracts and Memorandums of Understanding (MOU); and managing communications processes and equipment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
MINIMUM PERSONNEL PER TEAM	18	18	12	6	Not Specified.
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Incident Commander	1 – NIMS Type 2 Incident Commander	1 – NIMS Type 3 Incident Commander	1 – NIMS Type 3 Incident Commander	NIMS Rapid Needs Assessment Team Leader (National Qualification System [NQS])
SUPPORT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3, PLUS: 1 – NIMS Type 1 Air Operations Branch Director 1 – NIMS Type 1 GIS Specialist	Same as Type 4, PLUS: 1 – NIMS Type 3 Logistics Section Chief	1 – NIMS Type 3 Public Information Officer 1 – NIMS Type 1 Liaison Officer	1. IMT types and capabilities are tied to incident complexity.

DRAFT – INTERIM GUIDANCE – DRAFT

JUNE 2019

INCIDENT MANAGEMENT TEAM – WATER SECTOR INFRASTRUCTURE

2 of 6

Resource Typing Definition for Infrastructure Systems
Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
		1 – Computer Technical Specialist 1 – Finance/Administration Unit Leader 1 – Support/Service Branch Director 1 – Documentation Unit Leader	1 – NIMS Type 3 Operations Section Chief 1 – NIMS Type 3 Finance/Administration Section Chief 1 – NIMS Type 1 Situation Unit Leader 1 – NIMS Type 1 Resources Unit Leader 1 – NIMS Type 1 Communications Unit Leader	1 – NIMS Type 3 Planning Section Chief 1 – NIMS Type 3 Operations Section Chief 1 – NIMS Type 3 Safety Officer	2. An IMT of different complexity type may manage or support the incident until an appropriately typed IMT can deploy. 3. Command and general staff type must match the IMT type, though subordinate positions, such as unit leaders, are not tied to incident complexity and may be of a single type. 4. Personnel meet the minimum qualifications indicated in the appropriate position qualifications system, such as the NQS. Position typing schemes may vary depending on the qualifications system the AHJ uses. 5. Type 4 teams composed of command and general staff positions may exist for local or regional incident management but are not a NIMS typed resource. 6. Teams include two or more Operations Section Chiefs, who may serve as deputy, as Operations Section Chief for different operational periods, or as planning assistants. 7. Long-term configurations typically include additional positions, such as Service Branch Director, Support Branch Director, Facilities Unit Leader, Supply Unit Leader, Food Unit Leader,

DRAFT – INTERIM GUIDANCE – DRAFT

JUNE 2019

INCIDENT MANAGEMENT TEAM – WATER SECTOR INFRASTRUCTURE

3 of 6

Resource Typing Definition for Infrastructure Systems
Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
					<p>Medical Unit Leader, Ground Support Unit Leader, Ordering Manager, Communications Technician, Communications Center Manager, Documentation Unit Leader, Demobilization Unit Leader, GIS Specialist, two Division/Group Supervisors, Air Tactical Group Supervisor, Air Support Group Supervisor, Cost Unit Leader, Time Unit Leader, Compensation/Claims Unit Leader, and Procurement Unit Leader.</p> <p>8. The IMT may include an Intelligence and Investigations Section Chief, based on incident needs.</p> <p>9. The IMT may include technical specialists in specific areas, such as public health, access and functional needs (AFN), volunteer management, fire behavior, and more.</p> <p>10. Both short- and long-term configurations typically include several discretionary positions and trainees.</p> <p>11. The Computer Technical Specialist is not a NIMS typed position.</p>
MANAGEMENT CAPABILITY PER TEAM	Typically manages more than 500 personnel	Typically manages up to 500 personnel	Typically manages up to 200 personnel	Typically manages up to 100 personnel	<p>1. Standard office supplies include pens, clipboards, notepads.</p>

DRAFT – INTERIM GUIDANCE – DRAFT

JUNE 2019

INCIDENT MANAGEMENT TEAM – WATER SECTOR INFRASTRUCTURE

4 of 6

Resource Typing Definition for Infrastructure Systems Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
					2. Other equipment and supplies as needed based on ordering specifications.
SPECIALIZED EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	Same as Type 4	Basic office supplies and electronics equipment necessary to support development and distribution of Incident Action Plan (IAP), maps, and other mission needs for 72 hours of continuous operations	1. Office supplies are per section of the team. 2. This team uses an established resource tracking system, such as T-cards or another inventory system.
ELECTRONICS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	Same as Type 4	1. Laptop computers 2. Global Positioning System (GPS) 3. Appropriate software 4. Wireless hotspot 5. Printer/scanner/copier	1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as needed based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	Same as Type 4	1. Cell phone 2. Portable radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Radio specifications must be provided by the requestor. 3. Relevant chargers and back-up batteries must be included with battery powered portable equipment.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. The composition identified above represents the minimum personnel for a short-term configuration; additional personnel or resources may be necessary to meet the mission assignment, depending on incident complexity.
3. Personnel may be responsible for providing proof of qualification for the position assigned.
4. Requestor and provider negotiate the total number of positions on the team.

REFERENCES

1. FEMA, NIMS 509: Air Operations Branch Director
2. FEMA, NIMS 509: Air Support Group Supervisor
3. FEMA, NIMS 509: Air Tactical Group Supervisor
4. FEMA, NIMS 509: Communications Technician
5. FEMA, NIMS 509: Communications Unit Leader
6. FEMA, NIMS 509: Compensation/Claims Unit Leader
7. FEMA, NIMS 509: Cost Unit Leader
8. FEMA, NIMS 509: Documentation Unit Leader
9. FEMA, NIMS 509: Demobilization Unit Leader
10. FEMA, NIMS 509: Facilities Unit Leader
11. FEMA, NIMS 509: Finance/Administration Section Chief
12. FEMA, NIMS 509: Food Unit Leader
13. FEMA, NIMS 509: Geographic Information Systems Analyst
14. FEMA, NIMS 509: Geographic Information Systems Specialist
15. FEMA, NIMS 509: Ground Support Unit Leader
16. FEMA, NIMS 509: Incident Commander
17. FEMA, NIMS 509: Liaison Officer
18. FEMA, NIMS 509: Logistics Section Chief
19. FEMA, NIMS 509: Medical Unit Leader
20. FEMA, NIMS 509: Operations Section Chief
21. FEMA, NIMS 509: Ordering Team Leader, pending publication
22. FEMA, NIMS 509: Planning Section Chief
23. FEMA, NIMS 509: Procurement Unit Leader
24. FEMA, NIMS 509: Public Information Officer
25. FEMA, NIMS 509: Resources Unit Leader
26. FEMA, NIMS 509: Safety Officer
27. FEMA, NIMS 509: Service Branch Director
28. FEMA, NIMS 509: Situation Unit Leader
29. FEMA, NIMS 509: Supply Unit Leader
30. FEMA, NIMS 509: Support Branch Director
31. FEMA, NIMS 509: Time Unit Leader
32. All-Hazards Incident Management Teams Association (AHIMTA), Interstate Incident Management Team Qualifications System (IIMTQS) Guide, May 2016
33. AHIMTA, Interstate Mission Ready Package All-Hazards IMT Type 3, August 2014
34. National Interagency Fire Center, National Interagency Mobilization guide, March 2017

INITIAL ASSESSMENT TEAM – WATER SECTOR INFRASTRUCTURE

DESCRIPTION	The Initial Assessment Team – Water Sector Infrastructure conducts an initial capability assessment, identifies necessary resources, temporary measures, and situational awareness required to support response activities
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	<p>Initial Assessment Team – Water Sector Infrastructure:</p> <ol style="list-style-type: none"> 1. Assesses operational capacity of water sector infrastructure including treatment, production, distribution, and collection facilities. 2. Determines accessibility to the location, physical damage, power, and impacted service area 3. Determines extent of repair and temporary measures needed to support prioritizing response efforts 4. Assesses integrity of water distribution, collection, isolates leaks, and identifies areas needing repair 5. Photographs and documents initial condition of facilities and assets 6. Coordinates with incident command 7. Provides initial damage reports to the requestor, Incident Commander, Damage Assessment Team, and appropriate Emergency Operations Center (EOC)
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor specifies any specialty areas necessary, distribution, or collections experience 4. Requestor specifies any mission-specific supporting resources necessary 5. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 6. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	4	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Initial Assessment Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	3 – Support Staff	<p>Support staff, at the Initial Assessment Team Leader's discretion, may include:</p> <ul style="list-style-type: none"> NIMS Type 1 Utility Worker Specialist NIMS Type 1 Water Operations Team Leader NIMS Type 1 Wastewater Operations Team Leader NIMS Type 1 Civil Engineer NIMS Type 1 Structural Engineer NIMS Type 1 Generator Support Team Leader

COMPONENT	SINGLE TYPE	NOTES
SPECIALIZED EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Measuring devices 2. Basic first aid kit 3. Portable generator 4. Binoculars 5. Cutting/trimming device 6. Standard office supplies 7. Map of water infrastructure assets 8. ATC-20 guide and supplies 9. Flashlights and spotlights 	<ol style="list-style-type: none"> 1. Measuring devices may include tape and wheel measurers. 2. Standard office supplies include pens, clipboards, and notepads. 3. Other equipment and supplies as needed based on ordering specifications.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<ol style="list-style-type: none"> 1. Hard hat 2. Reflective vests 3. Gloves 4. Protective clothing 5. Protective footwear 6. Flashlight 	PPE is mission-specific and may vary by work environment; may include protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, masks, and confined space entry provisions.
ELECTRONICS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software 	<ol style="list-style-type: none"> 1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as needed based on ordering specifications. 3. If available, use of drones, aerial video capability, and rovers.
COMMUNICATIONS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Cell phone 2. Portable radio 	<ol style="list-style-type: none"> 1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Radio specifications must be provided by the requestor. 3. Relevant chargers and back-up batteries must be included with battery powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. Generator Support Team Leader may be requested to conduct generator assessments with this team.
3. Support team personnel may require confined space entry training and provisions.

REFERENCES

1. FEMA, NIMS 508: Damage Assessment Team – Public Works
2. FEMA, NIMS 509: Civil Engineer
3. FMEA, NIMS 509: Generator Support Team Leader – Water Sector Infrastructure

4. FEMA, NIMS 509: Incident Commander (NQS)
5. FEMA, NIMS 509: Structural Engineer
6. FEMA, NIMS 509: Initial Needs Assessment Team Leader
7. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
8. FEMA, NIMS 509: Water Operations Team Leader
9. FEMA, NIMS 509: Wastewater Operations Team Leader
10. Applied Training Council (ATC) 20 Field manual: post-earthquake safety evaluation of buildings, 2005
11. ATC 45 Field manual: safety evaluation of buildings after windstorms and floods, 2004
12. National Fire Protection Association (NFPA) 350 Guide for Safe Confined Space Entry and Work, 2019
13. Occupational Safety and Health Administration (OSHA) 29 CFR 1910.146

LOCATING TEAM – WATER SECTOR INFRASTRUCTURE

DESCRIPTION	The Locating Team – Water Sector Infrastructure is responsible for locating water and sewer mains, manholes, and valves
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Locating Team – Water Sector Infrastructure locates and documents locations of water and wastewater infrastructure assets
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor provides system mapping indicating water mains, sewer mains, and associated appurtenances needing to be located and, if possible, a representative familiar with the location of affected water and sewer infrastructure to accompany this team 4. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 5. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry and trenching and shoring

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	3	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Water Operations Team Leader OR NIMS Type 1 Wastewater Operations Team Leader	Requestor specifies the type of infrastructure and request the corresponding NIMS Type 1 Water Operations Team Leader or NIMS Type 1 Wastewater Operations Team Leader.
SUPPORT PERSONNEL PER TEAM	2 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
SPECIALIZED EQUIPMENT PER TEAM	<p>Necessary equipment, including:</p> <ol style="list-style-type: none"> 1. Infrastructure locating equipment 2. System maps 3. Marking materials as appropriate 4. Expendable supplies 5. Hand tools as necessary for the task and location 6. Traffic management cones or other traffic control devices 	<ol style="list-style-type: none"> 1. Infrastructure-locating equipment may include ground-penetrating radar, electronic tracing equipment for tracer wire, metal detectors, and other traditional methods. 2. Hand tools may include tape measure, screwdrivers, bolt cutters or other cutting tools, assorted wrenches, shovel, crowbar or lift tool, chainsaw, pick, small sledgehammer, and garden trowel.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<p>PPE is mission-specific and may include:</p> <ol style="list-style-type: none"> 1. Hard hat 2. Reflective vests 3. Gloves 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
	4. Respiratory devices 5. Protective clothing 6. Protective footwear 7. Flashlight	
ELECTRONICS EQUIPMENT PER TEAM	1. Laptop 2. Appropriate software 3. GPS	Appropriate software includes word processing, spreadsheet, Geographic Information System (GIS), and database management programs.
COMMUNICATIONS EQUIPMENT PER TEAM	1. Cell phone 2. Portable two-way radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
2. FEMA, NIMS 509: Wastewater Operations Team Leader
3. FEMA, NIMS 509: Water Operations Team Leader

MAINTENANCE AND REPAIR TEAM – LIGHT EQUIPMENT PUBLIC WORKS

DESCRIPTION	The Maintenance and Repair Team - Light Equipment Public Works performs preventative maintenance and repair on response vehicles and equipment
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	This team provides light repairs, lubrication, tire repair, and other preventive maintenance of vehicles and light equipment, including vehicles and trailered equipment
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor identifies supporting resources necessary based on mission requirements 4. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 5. Requestor specifies any necessary safety qualifications and equipment 6. Requestor provides a full complement of industry-specific tools necessary for the repairs indicated within the function, such as power tools, hand tools and other equipment repair needs

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	3	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – Maintenance and Repair Team Leader – Public Works	Maintenance and Repair Team Leader – Public Works is not a National Incident Management System (NIMS) typed position.
SUPPORT PERSONNEL PER TEAM	1 – Technician 1 – Service Technician	<ol style="list-style-type: none"> 1. The AHJ will specify criteria or certifications for the support personnel. 2. Technician and Service Technician are not National Incident Management System (NIMS) typed positions.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	PPE is mission-specific and may include: <ol style="list-style-type: none"> 1. Hard hat 2. Reflective vests 3. Gloves 4. Protective clothing 5. Protective footwear 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
COMMUNICATIONS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Cell phone 2. Portable radio 	<ol style="list-style-type: none"> 1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Relevant chargers and back-up batteries must be included with battery powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

None

OPERATIONS TEAM – WASTEWATER TREATMENT FACILITY

DESCRIPTION	The Operations Team – Wastewater Treatment Facility operates water production facilities
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Operations Team – Wastewater Treatment Facility operates wastewater production facilities, of various sizes, with various conveyance facilities, treatment plants, and pump stations
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor specifies treatment type, such as primary, secondary, tertiary, and Biological Nutrient Removal (BNR) 4. Requestor specifies disinfection type, such as chlorination or ultra-violet (UV) 5. Requestor specifies Lead Operator familiar with the treatment process and plant shut-down and start-up. 6. Requestor provides plant schematics 7. Requestor specifies control systems used, such as electronic, pneumatic, or hydraulic 8. Requestor specifies facility capacity in millions of gallons per day (MGD) 9. Requestor specifies certifications necessary, such as Hazardous Waste Operations and Emergency Response (HAZWOPER) and operator Certifications 10. Requestor specifies any necessary safety qualifications and/or equipment, such as confined space entry

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	3	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Wastewater Operations Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	2 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	NIMS Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
SPECIALIZED EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Samplers 2. Probes 3. Operational testing equipment 	Equipment includes a full complement of industry-specific tools necessary for the operations indicated within the function.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<ol style="list-style-type: none"> 1. Hard hat 2. Reflective vest 3. Gloves 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
	4. Protective clothing 5. Protective footwear 6. Flashlight	
ELECTRONICS EQUIPMENT PER TEAM	1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software	1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as necessary based on ordering specifications
COMMUNICATIONS EQUIPMENT PER TEAM	1. Cell phone 2. Portable radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. If utility only requires additional personnel to support operations use the 509 Utility Worker Specialist - Water Sector Infrastructure.

REFERENCES

1. FEMA, NIMS 508: Repair and Start-Up Team – Wastewater Treatment Facility
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
3. FEMA, NIMS 509: Wastewater Operations Team Leader

OPERATIONS TEAM – WATER TREATMENT FACILITY

DESCRIPTION	The Operations Team – Water Treatment Facility operates water production facilities
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Operations Team – Water Treatment Facility operates water production facilities, appropriate to size, such as millions of gallons per day (MGD), with various settling systems, including wells, intake structures, raw water conveyance facilities, treatment plants, and pump stations. This team does address intake structures that require boats.
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor specifies treatment type, such as direct filtration, secondary disinfection, sedimentation, MIOX, Granular Activated Carbon (GAC), Powdered Activated Carbon (PAC), or membrane 4. Requestor specifies disinfection type, such as chlorine, bleach, chloramines, ozonation, or ultra-violet (UV) 5. Requestor specifies Lead Operator familiar with the treatment process and plant shut-down and start-up, as well as plant schematics 6. Requestor specifies types of facilities/processes in need of assessment and repair 7. Requestor specifies facility capacity in MGD 8. Requestor specifies water source and type, and any specialized certifications necessary, such as Hazardous Waste Operations and Emergency Response (HAZWOPER) and Operator Certifications 9. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 10. Requestor specifies any necessary safety qualifications and equipment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	3	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Water Operations Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	2 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	NIMS Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
SPECIALIZED EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Diagnostic equipment 2. Expendable supplies 	Other equipment and supplies as necessary, based on ordering specifications.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<ol style="list-style-type: none"> 1. Hard hat 2. Reflective vests 3. Gloves 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
	4. Protective clothing 5. Protective footwear 6. Flashlight	
ELECTRONICS EQUIPMENT PER TEAM	1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software	1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as needed based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	1. Cell phone 2. Portable radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. If utility only requires additional personnel to support operations use the 509 Utility Worker Specialist - Water Sector Infrastructure.

REFERENCES

1. FEMA, NIMS 508: Repair and Startup Team – Water Treatment Facility
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
3. FEMA, NIMS 509: Water Operations Team Leader

PLANT UTILITY CONTROL SYSTEMS TEAM – WATER SECTOR INFRASTRUCTURE

DESCRIPTION	The Plant Utility Control Systems Team – Water Sector Infrastructure restores and repairs Supervisory Control and Data Acquisition (SCADA) and radio telemetry systems.
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Plant Utility Control Systems Team – Water Sector Infrastructure restores and repairs radio communications, SCADA, telemetry, plant control systems, and programmable logic controllers (PLC).
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for this team, such as security, lodging, transportation, and meals, prior to deployment 2. The team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable up to 14 days 3. Requestor specifies human machine interface (HMI), PLC brand and model, mode of communication, and other unique requirements 4. Requestor orders mission-specific Utility Worker Specialists as single resources to supplement the team based on the equipment for repair 5. Requestor specifies major repair components 6. Requestor provides external support to the team, such as fuel and power for recharging phones, computers, and other rechargeable devices 7. Requestor specifies any necessary safety qualifications and equipment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
MINIMUM PERSONNEL PER TEAM	3	3	2	Not applicable	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3	1 – National Incident Management System (NIMS) Type 2 Water Operations Team Leader OR NIMS Type 2 Wastewater Operations Team Leader	Not applicable	Requestor specifies the type of facility associated with the control systems and requests the corresponding Water Operations Team Leader or Wastewater Operations Team Leader.
SUPPORT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3, PLUS: 2 – NIMS Type 1 Utility Specialist – Water Sector Infrastructure	1 – NIMS Type 1 Utility Specialist – Water Sector Infrastructure	Not applicable	Utility Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
CAPABILITY PER TEAM	Same as Type 2, PLUS: Repairing and restoring plant control systems and PLCs.	Same as Type 3, PLUS: Troubleshooting and repairing remote SCADA and telemetry systems	Capable of troubleshooting and repairing communications system cabling.	Not applicable	Requestor specifies types of communications infrastructure, SCADA software, and other control specifications when requesting the team.

Resource Typing Definition for Infrastructure Systems
Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
CAPABILITY EQUIPMENT PER TEAM	Same as Type 2 PLUS: 1. Necessary tools for plant controls and PLC repairs	Same as Type 3 PLUS: 1. Digital multi-meter with amp clamp 2. 4-20 milliamp signal generator 3. Bucket truck	1. Necessary tools for SCADA repairs 2. Port tools for cable repairs 3. Hand-digging tools	Not applicable	1. Equipment includes a full complement of industry-specific tools necessary for the repairs indicated within the function, i.e., power tools and hand tools. 2. On Type 1 and 2 bucket truck, working height needs to be specified by requestor.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	Same as Type 2	Same as Type 3	1. Hard hat 2. Reflective vest 3. Gloves 4. Protective clothing 5. Protective footwear	Not applicable	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1. Laptop computer with serial port with appropriate software 2. Appropriate software	Not applicable	Appropriate software includes operating system, word processing, spreadsheet, and database management programs.
COMMUNICATIONS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1. Cell phone 2. Portable radio	Not applicable	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1 – Truck/SUV	Not applicable	Vehicles should be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 509: Supervisory Control and Data Acquisition Specialist
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
3. FEMA, NIMS 509: Water Operations Team Leader
4. FEMA, NIMS 509: Wastewater Operations Team Leader

REPAIR AND START-UP TEAM – WASTEWATER TREATMENT FACILITY

DESCRIPTION	The Repair and Start-Up Team – Wastewater Treatment Facility repairs and makes operational all types of water treatment facilities
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Repair and Start-Up Team – Wastewater Treatment Facility repairs all types of wastewater treatment facilities, regardless of size, with various treatment systems, conveyance facilities, treatment plants, and pump stations. This team does not perform structural and similar scale repairs.
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor specifies treatment type, such as primary, secondary, tertiary, and/or Biological Nutrient Removal (BNR) 4. Requestor specifies disinfection type, such as chlorination or ultra violet (UV) 5. Requestor specifies Lead Operator familiar with the treatment process and plant shut-down and start-up 6. Requestor provides plant schematics 7. Requestor specifies control systems used, such as electronic, pneumatic, or hydraulic 8. Requestor specifies facility capacity in millions of gallons per day (MGD) 9. Requestor specifies the necessary gallons per minute (GPM) capacity, maximum solids handling, necessary equipment head, and equipment suction 10. Requestor specifies certifications necessary such as Hazardous Waste Operations and Emergency Response (HAZWOPER) and/or Operator Certifications 11. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 12. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry and trenching and shoring

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	4	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Wastewater Operations Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	3 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, mechanics, or instrumentation technicians
SPECIALIZED EQUIPMENT PER TEAM	1 – Air compressor 1 – Mud pump 1 – Heavy duty pick-up truck with equipment boom	Equipment includes a full complement of industry-specific tools necessary for the operations indicated within the function.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER	1. Hard hat 2. Reflective vest	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
TEAM MEMBER	3. Gloves 4. Protective clothing 5. Protective footwear 6. Flashlight	
ELECTRONICS EQUIPMENT PER TEAM	1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software	1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as necessary based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	1. Cell phone 2. Portable radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Operations Team – Wastewater Treatment Facility
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
3. FEMA, NIMS 509: Wastewater Operations Team Leader

REPAIR AND START-UP TEAM – WATER TREATMENT FACILITY

DESCRIPTION	The Repair and Start-Up Team – Water Treatment Facility repairs all types of water treatment facilities
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Repair and Start-Up Team – Water Treatment Facility repairs all types of water production facilities, regardless of size, with various settling systems, including intake facilities, raw water conveyance facilities, and treatment plants. This team does not repair pump stations.
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor specifies treatment type, such as direct filtration, secondary disinfection, sedimentation, MIOX, Granular Activated Carbon (GAC), Powdered Activated Carbon (PAC) or membrane 4. Requestor specifies disinfection type, such as chlorine, bleach, chloramines, ozonation, or ultra-violet (UV) 5. Requestor supplies Lead Operator familiar with the treatment process and plant shut-down and start-up 6. Requestor supplies plant schematics 7. Requestor specifies types of facilities/processes in need of assessment and repair 8. Requestor specifies facility capacity in millions of gallons per day (MGD) 9. Requestor specifies certifications necessary, such as Hazardous Waste Operations and Emergency Response (HAZWOPER) and/or Operator Certifications 10. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 11. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry and trenching and shoring

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	4	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Water Operations Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	3 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	NIMS Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
SPECIALIZED EQUIPMENT PER TEAM	1 – Air compressor 1 – Mud pump 1 – Heavy duty pick-up truck with equipment boom	Equipment includes pneumatic tools, small power tools, and hand tools necessary for the repairs indicated.

COMPONENT	SINGLE TYPE	NOTES
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<ol style="list-style-type: none"> 1. Hard hat 2. Reflective vests 3. Gloves 4. Protective clothing 5. Protective footwear 6. Flashlight 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software 	<ol style="list-style-type: none"> 1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as necessary based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Cell phone 2. Portable radio 	<ol style="list-style-type: none"> 1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Operations Team – Water Treatment Facilities
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
3. FEMA, NIMS 509: Water Operations Team Leader

REPAIR AND START-UP TEAM LIFT AND PUMP STATIONS – WASTEWATER FACILITY

DESCRIPTION	The Repair and Start-Up Team Lift and Pump Stations – Wastewater Facility is responsible for the assessment and repair of all types of wastewater lift station and pump facilities, regardless of size, including conveyance facilities, treatment plants, and pump stations, excluding structural and similar scale repairs
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	Repair and Start-Up Team Lift and Pump Stations – Wastewater Facility repairs and makes operational wastewater lift and pump stations
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor orders mission-specific National Incident Management System (NIMS) Type 1 Utility Worker Specialists as single resources to supplement the team, such as, mechanic, welder, electrician, or repair technician 4. Requestor specifies types of facilities in need of assessment and repair in which expertise is needed, as well as any materials that should be provided by the responder 5. Requestor specifies control systems used such as electronic, pneumatic, or hydraulic 6. Requestor specifies facility capacity in millions of gallons per day (MGD) 7. Requestor specifies voltage(s) involved for electrical repairs 8. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 9. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry and trenching and shoring

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
MINIMUM PERSONNEL PER TEAM	4	4	2	Not Applicable	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3	1 - NIMS Wastewater Operations Team Leader	Not Applicable	Not Specified
SUPPORT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3, PLUS: 2 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	Not Applicable	NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
PUMP REPAIR CAPABILITY PER TEAM	Wastewater pumps greater than 400 horsepower (HP)	Wastewater facility pumps of 26–400 HP	Wastewater facility pump of 25 HP or smaller	Not Applicable	Requestor must provide specifics for the pump needing repair.

Resource Typing Definition for Infrastructure Systems
Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
SPECIALIZED EQUIPMENT PER TEAM	Same as type 2	Same as type 3	1. Air compressor 2. Mud pump	Not Applicable	Equipment includes a full complement of industry-specific tools necessary for the repairs indicated within the function, such as power tools, hand tools, pumps.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	Same as Type 2	Same as Type 3	1. Hard hat 2. Reflective vest 3. Gloves 4. Protective clothing 5. Protective footwear 6. Lock-out tag-out equipment	Not Applicable	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1. Laptop computer 2. Appropriate software 3. Digital multimeter with amp clamp	Not Applicable	Appropriate software includes word processing, spreadsheet, and database management programs.
COMMUNICATIONS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1. Cell phone 2. Portable radio	Not Applicable	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	Same as Type 2 PLUS: 1 – 30-ton crane	Same as type 3, PLUS: 1 – 10-ton equipment boom	1. Heavy duty pickup with equipment boom 2. Trailer, if pump mounted	Not Applicable	1. Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation. 2. Vehicle must be equipped with tow hitch and various attachment capability.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. This team may be asked to conduct water/wastewater sampling post-repair.
3. Crane to come with appropriate operator.

REFERENCES

1. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
2. FEMA, NIMS 509: Wastewater Operations Team Leader

REPAIR AND START-UP TEAM WATER PUMP FACILITIES – WATER PRODUCTION

DESCRIPTION	The Repair and Start-Up Team Water Pump Facilities – Water Production repairs all types of water pump facilities, regardless of size, including intake facilities, raw water conveyance facilities, treatment plants, and pump stations. This team does not repair intake facilities that require boats, nor does it repair structural and similar scale damage.
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	Repair and Start-Up Team Water Pump Facilities – Water Production repairs water pump facilities
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor orders mission-specific National Incident Management System (NIMS) Type 1 Utility Worker Specialists as single resources to supplement this team, such as, mechanic, welder, electrician, or repair technician 4. Requestor specifies types of pump facilities in need of assessment and repair in which expertise is needed, as well as any materials to provide 5. Requestor specifies control systems used such as electronic, pneumatic, or hydraulic 6. Requestor specifies facility capacity in millions of gallons per day (MGD) 7. Requestor specifies type of pumps needing repair 8. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 9. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry and trenching and shoring

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
MINIMUM PERSONNEL PER TEAM	4	4	2	Not Applicable	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3	1 - NIMS Type 1 Water Operations Team Leader	Not Applicable	Not Specified
SUPPORT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3, PLUS: 2 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	Not Applicable	NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
PUMP REPAIR CAPABILITY PER TEAM	Water pumps greater than 400 horsepower (HP)	Water facility pumps of 26–400 HP	Water facility pump of 25 HP or smaller	Not Applicable	Requestor provides specifics on the pump needing repair.

Resource Typing Definition for Infrastructure Systems
Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
SPECIALIZED EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1. Air compressor 2. Mud pump	Not Applicable	Equipment includes a full complement of industry-specific tools necessary for the repairs indicated within the function, such as power tools, hand tools, pumps.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	Same as Type 2	Same as Type 3	1. Hard hat 2. Reflective vest 3. Gloves 4. Protective clothing 5. Protective footwear 6. Lock-out tag-out equipment	Not Applicable	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1. Laptop computer 2. Appropriate software 3. Digital multimeter with amp clamp	Not Applicable	Appropriate software includes word processing, spreadsheet, and database management programs.
COMMUNICATIONS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1. Cell phone 2. Portable radio	Not Applicable	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	Same as Type 2, PLUS: 1 – 30-ton crane	Same as type 3, PLUS: 1 – 10-ton equipment boom	1. Heavy Duty Pickup with equipment boom 2. Trailer, if pump mounted	Not Applicable	1. Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation. 2. Vehicle should be equipped with tow hitch and various attachment capability.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. This team may be asked to conduct water sampling post-repair.
3. Crane to come with appropriate operator.

REFERENCES

1. FEMA, NIMS 509: Utility Worker Specialist - Water Sector Infrastructure
2. FEMA, NIMS 509: Water Operations Team Leader

REPAIR TEAM – WATER DISTRIBUTION SYSTEM

DESCRIPTION	The Repair Team – Water Distribution System repairs system mains, valves, hydrants, and other water distribution infrastructure
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Repair Team – Water Distribution System repairs all types of mains, valves, hydrants, storage facilities, and excavation through backfill, in all types of water distribution facilities. This team does not repair pump stations.
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor orders mission-specific National Incident Management System (NIMS) Type 1 Utility Worker Specialists as single resources to supplement this team, such as, mechanic, welder, electrician, or repair technician 4. Requestor specifies facilities that need repair, including specific water main materials and size ranges, typical depth of facilities and soil conditions, and any materials that responders should provide 5. Requestor specifies details regarding water distribution facilities, including specific types of system components in need of repair, typical depth and soil condition, hydrant makes and models, and other specific materials 6. Requestor provides plans showing water main locations and coordinates notification of "call-before-you dig"-type services used in the region 7. Requestor specifies depth of main repair in order for the provider to determine shoring and trenching protection equipment 8. Based on the mission, the requestor and provider coordinate welder and welding equipment, traffic control considerations, and other deployment requirements 9. Requestor orders NIMS typed water valve maintenance truck/trailer equipment in conjunction with any of the typed teams to support exercising water valves and valve box/catch basin cleaning, if necessary 10. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable device 11. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry and trenching and shoring

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
MINIMUM PERSONNEL PER TEAM	8	7	6	5	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3	Same as Type 4	1 – NIMS Type 1 Water Operations Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	Same as Type 2, PLUS: 1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	Same as Type 3, PLUS: 1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	Same as Type 4, PLUS: 1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	4 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure may include

Resource Typing Definition for Infrastructure Systems
Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
					welders, electricians, or mechanics.
REPAIR CAPABILITY PER TEAM	24 inches and larger with depths up to 20 feet	24 inches and smaller with depths up to 20 feet	12 inches and smaller with depths up to 10 feet	12 inches and smaller with depths up to 6 feet	Not Specified
SPECIALIZED EQUIPMENT PER TEAM	Same as Type 2 PLUS: 1 – Type 3 hydraulic excavator (medium mass excavation 4 cubic yard to 1.85 cubic yard buckets) 1 – Truck with equipment boom	Same as Type 3	Same as Type 4 PLUS: 1 – Tandem dump truck	1 – Backhoe loader 1 – Utility truck 1 – Tandem dump truck	Equipment includes a full complement of industry-specific tools necessary for the operations indicated within the function.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	Same as Type 2	Same as Type 3	Same as Type 4	1. Hard hat 2. Reflective vests 3. Gloves 4. Protective clothing 5. Protective footwear 6. Flashlight	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	Same as Type 4	1. Laptop computer 2. Digital camera 3. GPS 4. Appropriate software	1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as needed based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	Same as Type 4	1. Cell phone 2. Portable radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3, PLUS: 1 – Truck/SUV	Same as Type 4	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry



Resource Typing Definition for Infrastructure Systems Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
					necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: System Flushing and Flow Testing Team – Water Distribution
2. FEMA, NIMS 508: Water Valve Maintenance (Truck/Trailer) – Water Distribution
3. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
4. FEMA, NIMS 509: Water Operations Team Leader

REPAIR TEAM SEWER MAINS – WASTEWATER

DESCRIPTION	The Repair Team Sewer Mains – Wastewater repairs all types of wastewater mains
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	This team is responsible for the assessment and repair of all types of wastewater collection, storm water collection, and reclaimed water distribution assets, including some that operate under pressure. This includes gravity mains, force mains, aerial mains, manholes, and excavation through backfill. Lift and pump stations are not included in this team. These repairs may require bypass pumping.
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor orders mission-specific National Incident Management System (NIMS) Type 1 Utility Worker Specialists as single resources to supplement this team, such as, mechanic, welder, electrician, or repair technician 4. Requestor specifies assets that need repair expertise, including specific main materials and size ranges, typical depth of facilities and soil conditions, and any materials that responders need to provide 5. Requestor provides plans showing main locations and coordinates notification of "call-before-you dig"-type services used in the region 6. Based on the mission, the requestor and provider coordinate welder and welding equipment, traffic control considerations, and materials the requestor or others provide 7. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 8. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry and trenching and shoring

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
MINIMUM PERSONNEL PER TEAM	6	6	5	Not Applicable	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3	1 – NIMS Type 1 Wastewater Operations Team Leader	Not Applicable	Not Specified
SUPPORT PERSONNEL PER TEAM	Same as Type 2	Same as Type 3, PLUS: 1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	4 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	Not Applicable	NIMS Type 1 Utility Worker Specialist may include welders, or mechanics.
DIAMETER MAIN PER TEAM	More than 24 inches (")	12"-24"	Up to 12"	Not Applicable	All types provided adhere to necessary disinfection procedures.

Resource Typing Definition for Infrastructure Systems
Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
SPECIALIZED EQUIPMENT PER TEAM	Same as Type 2, PLUS: 1 – Large track excavator	1 – Large track excavator	1 – Backhoe loader 2 – Tandem dump truck	Not Applicable	<ol style="list-style-type: none"> Equipment includes a full complement of industry-specific tools necessary for the repairs indicated within the function, such as power tools, hand tools, pumps. Type 1 team includes appropriate trench boxes and other shoring equipment as required
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	Same as Type 2	Same as Type 3	<ol style="list-style-type: none"> Hard hat Reflective vests Gloves Protective clothing Protective footwear Flashlight 	Not Applicable	PPE is mission specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	<ol style="list-style-type: none"> Laptop computer Digital camera GPS Appropriate software 	Not Applicable	<ol style="list-style-type: none"> Appropriate software includes word processing, spreadsheet, and database management programs. Other equipment and supplies as needed based on ordering specifications
COMMUNICATIONS EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	<ol style="list-style-type: none"> Cell phone Portable radio 	Not Applicable	<ol style="list-style-type: none"> Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. Requestor provides radio specifications. Provider includes relevant chargers and back-up batteries battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	Same as Type 2	Same as Type 3	1 – Truck/SUV	Not Applicable	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. Heavy equipment to come with appropriate operator.
3. This team may be required to conduct wastewater field sampling and testing.

REFERENCES

1. FEMA, NIMS 508: Repair and Startup Team Pumps and Lift Stations – Wastewater
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
3. FEMA, NIMS 509: Wastewater Operations Team Leader

SEWER SYSTEM CLOSED CIRCUIT TELEVISION TEAM – WASTEWATER

DESCRIPTION	The Sewer System Closed Circuit Television Team (CCTV) – Wastewater provides nondestructive CCTV services for inspection of sewer systems
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Sewer System CCTV Team – Wastewater provides sewer mains CCTV inspections for identifying repair and rehabilitation
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor provides system maps indicating sewer mains and manholes needing location or other resources for this team to locate the system and, if possible, a representative familiar with the location of affected sewer mains and manholes to accompany this team 4. Requestor specifies if confined space training, certification, and equipment is necessary 5. Requestor provides the team with GPS coordinate information when possible 6. CCTV equipment for the team may vary based on environment 7. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 8. Requestor specifies any necessary safety qualifications and equipment, such as confined space entry and trenching and shoring

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	2	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Wastewater Operations Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	NIMS Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
SPECIALIZED EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Push rod or robotic crawler 2. Minimum 400 feet of cable 3. System maps 4. Hand tools as necessary for the task and location 5. Gas detection device 6. Traffic management cones or other traffic control devices 	Hand tools may include tape measure, screwdrivers, bolt cutters or other cutting tools, assorted wrenches, shovel, crowbar or lift tool, chainsaw, and garden trowel.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	PPE is mission-specific and may include: <ol style="list-style-type: none"> 1. Hard hat 2. Reflective vests 	PPE is mission specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
	3. Gloves 4. Respiratory devices 5. Protective clothing 6. Protective footwear 7. Protective shields 8. Flashlight	
ELECTRONICS EQUIPMENT PER TEAM	1. Laptop 2. GPS 3. Televising equipment 4. Wireless internet connection device	Other equipment and supplies as needed based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	1. Cell phone 2. Portable two-way radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Light duty vehicle and/or towable trailer with mounted televising equipment	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Repair Teams Sewer Mains – Wastewater
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
3. FEMA, NIMS 509: Water Operations Team Leader
4. OSHA 29 CFR Part 1910.146: Permit-Required Confined Spaces

SYSTEM FLUSHING AND FLOW TESTING TEAM – WATER DISTRIBUTION

DESCRIPTION	The System Flushing and Flow Testing Team – Water Distribution conducts a flushing cleanout of the water distribution pipes, tests the water supply throughout the distribution network, and conducts basic water quality field testing
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The System Flushing and Flow Testing Team – Water Distribution: <ol style="list-style-type: none"> 1. Cleans water distribution pipes with flushing from hydrants and blow-offs 2. Tests the water supply throughout the distribution system 3. Conducts basic water quality field testing
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor specifies any mission-specific supporting resources and requirements necessary for deployment 4. Requestor provides a representative familiar with the affected distribution system to accompany this team 5. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 6. Requestor specifies any necessary safety qualifications and equipment

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	2	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Water Operations Team Leader	Not Specified
SUPPORT PERSONNEL PER TEAM	1 – NIMS Type 1 Utility Worker Specialist – Water Sector Infrastructure	NIMS Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
SPECIALIZED EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Diffuser 2. Dechlorinator 3. Flow testing gauges 4. Sampling containers 5. Field test kits, colorimeter/turbidimeter 6. Reagents 7. Transport cooler for field samples 	Requestor will provide ice for sample transport as necessary.

COMPONENT	SINGLE TYPE	NOTES
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<ol style="list-style-type: none"> 1. Hard hat 2. Reflective vests 3. Gloves 4. Protective clothing 5. Protective footwear 6. Flashlight 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.
ELECTRONICS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Laptop computer 2. GPS 3. Appropriate software 	<ol style="list-style-type: none"> 1. Appropriate software includes word processing, spreadsheet, and database management programs. 2. Other equipment and supplies as needed based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Cell phone 2. Portable radio 	<ol style="list-style-type: none"> 1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions, adverse environments, and carry necessary equipment to maintain vehicle operation.

NOTES

1. Nationally typed resources represent the minimum criteria for the associated component and capability.
2. Sampling under this team is assumed to be non-hazardous.
3. If utility only requires additional personnel to support operations use the 509 Utility Worker Specialist - Water Sector Infrastructure.

REFERENCES

1. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
2. FEMA, NIMS 509: Water Operations Team Leader

WATER MAIN LEAK LOCATING TEAM – WATER DISTRIBUTION

DESCRIPTION	The Water Main Leak Locating Team – Water Distribution locates and records water main leaks for repair
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Team
OVERALL FUNCTION	The Water Main Leak Locating Team – Water Distribution locates and records locations of water main leaks and documents locations
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor and provider discuss logistics for deploying this team, such as security, lodging, transportation, and meals, prior to deployment 2. This team typically works 12 hours per shift, is self-sustainable for 72 hours, and is deployable for up to 14 days 3. Requestor provides system maps indicating mains and other resources for this team to locate the system and, if possible, a representative familiar with the location of affected area to accompany this team 4. Requestor provides details on the system, such as pipe materials, geologic conditions, and surface conditions 5. Requestor provides external support to this team, such as fuel and power for recharging phones, computers, and other rechargeable devices 6. Requestor specifies any necessary safety qualifications and/or equipment, such as confined space entry

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	SINGLE TYPE	NOTES
MINIMUM PERSONNEL PER TEAM	2	Not Specified
MANAGEMENT AND OVERSIGHT PERSONNEL PER TEAM	1 – National Incident Management System (NIMS) Type 1 Water Operations Team Leader	The Authority Having Jurisdiction (AHJ) will specify criteria or certifications for the support personnel.
SUPPORT PERSONNEL PER TEAM	1 – NIMS Type 1 Utility Worker Specialist - Water Sector Infrastructure	NIMS Utility Worker Specialist – Water Sector Infrastructure may include welders, electricians, or mechanics.
SPECIALIZED EQUIPMENT PER TEAM	<ol style="list-style-type: none"> 1. Infrastructure locating equipment 2. System maps 3. Marking paint 4. Expendable supplies 5. Hand tools as necessary for the task and location 6. Traffic management cones or other traffic control devices 	<ol style="list-style-type: none"> 1. Infrastructure locating equipment may include basic acoustic leak locating, geophone leak locating, electronic noise correlation, and infrared. 2. Hand tools may include tape measure, screwdrivers, bolt cutters or other cutting tools, assorted wrenches, shovel, crowbar or lift tool, chainsaw, and garden trowel.
PERSONAL PROTECTIVE EQUIPMENT (PPE) PER TEAM MEMBER	<ol style="list-style-type: none"> 1. Hard hat 2. Reflective vests 3. Gloves 4. Protective clothing 	PPE is mission-specific and may vary by work environment; it includes protective footwear, protective clothing for skin exposure, eye and ear protection, respirators, gloves, and masks.

COMPONENT	SINGLE TYPE	NOTES
	5. Protective footwear 6. Flashlight	
ELECTRONICS EQUIPMENT PER TEAM	1. Laptop 2. Appropriate software 3. GPS	1. Appropriate software includes word processing, spreadsheet, Geographic Information System (GIS), and database management programs appropriate to mission specific deployment. 2. Other equipment and supplies as needed based on ordering specifications.
COMMUNICATIONS EQUIPMENT PER TEAM	1. Cell phone 2. Portable radio	1. Consider alternate forms of communication, such as satellite phones, based on the mission assignment and team needs. 2. Requestor provides radio specifications. 3. Provider includes relevant chargers and back-up batteries with battery-powered portable equipment.
TRANSPORTATION EQUIPMENT PER TEAM	1 – Truck/SUV	Vehicles must be capable of traversing rough terrain, flood conditions and/or adverse environment and carry necessary equipment to maintain vehicle operation.

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Repair Team – Water Distribution System
2. FEMA, NIMS 508: Repair Team Sewer Mains – Wastewater
3. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure
4. FEMA, NIMS 509: Water Operations Team Leader

Attachment D: Equipment Resource Types

- Sewer System Cleaning – Wastewater
- Water Valve Maintenance (Truck/Trailer) – Water Distribution
- Water Pump, Dewatering
- Water Pumps, Drinking Water Supply – Untreated Source
- Water Pump, Wastewater
- Water Pump, Water Distribution

SEWER SYSTEM CLEANING – WASTEWATER

DESCRIPTION	Equipment for cleaning wastewater sewer system infrastructure
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Equipment
OVERALL FUNCTION	Equipment for cleaning wastewater sewer system infrastructure including: <ol style="list-style-type: none"> 1. Sewer mains 2. Manholes 3. Combined sewer overflows (CSO) 4. Sanitary sewer overflows (SSO)
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Can be ordered in conjunction with National Incident Management System (NIMS) typed team (Repair Team Sewer Mains – Wastewater, Repair and Startup Team Lift and Pump Stations – Wastewater) 2. Can be ordered with staff using the NIMS Utility Worker Specialist – Water Sector Infrastructure 3. Requestor verifies trailer connection compatibility if equipment is trailer-mounted 4. Requestor verifies equipment fuel requirements 5. Type 1, Type 2, or Type 3 teams may conduct SSO/CSO cleanup, as the requestor specifies

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
EQUIPMENT DESCRIPTION	Sewer jet/vac truck (combination sewer cleaning machine)	Sewer jet truck/trailer	Sewer power rod truck	Not Applicable	Not Specified
EQUIPMENT CAPACITY	5000 Cubic Feet Per Minute at 18-inch Hg vacuum	Not Specified	Not Specified	Not Applicable	Not Specified
EQUIPMENT SPECIFICATION	Positive displacement (Pref) 50 gallons per minute (GPM) and 2,000 pounds per square Inch (PSI)	40 GPM and 2000 PSI	Not Specified	Not Applicable	Not Specified
EQUIPMENT HOSE REACH	Same as Type 2	600 feet	Not Specified	Not Applicable	Not Specified
EQUIPMENT DEBRIS TANK	≥10 cubic yards (CUYD)	Not Specified	Not Specified	Not Applicable	Not Specified
EQUIPMENT WATER TANK	500 – 2,000 gallons	500 gallons	Not Specified	Not Applicable	Not Specified

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability

REFERENCES

FEMA, NIMS 508: Repair Team Sewer Mains – Wastewater
FEMA, NIMS 508: Repair and Startup Team Lift and Pump Stations - Wastewater
FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure

WATER VALVE MAINTENANCE (TRUCK/TRAILER) – WATER DISTRIBUTION

DESCRIPTION	Trailer or truck-mounted equipment for exercising water distribution valves, valve box clean out
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Equipment
OVERALL FUNCTION	Equipment to support the operation and exercising of water valves and valve box cleaning
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Can be ordered in conjunction with National Incident Management System (NIMS) typed team (Repair and Startup Team – Water Distribution) 2. Can be ordered with staff using the NIMS Utility Worker Specialist – Water Sector Infrastructure 3. Requestor verifies trailer connection compatibility if equipment is trailer-mounted

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
EQUIPMENT DESCRIPTION	<ol style="list-style-type: none"> 1. Truck-mounted valve exerciser 2. Mounted vacuum 	Trailer-mounted valve exercise with vacuum	Trailer or truck-mounted valve exerciser	Not Applicable	Not Specified
EQUIPMENT VALVE EXERCISER TORQUE	Same as Type 2	Same as Type 3	Up to 750 ft/pound (lb)	Not Applicable	Not Specified
EQUIPMENT CAPACITY	Same as Type 2	Same as Type 3	4-inch valves and larger	Not Applicable	Not Specified
EQUIPMENT VALVE EXERCISER SPEED	Same as Type 2	4-68 Revolutions Per Minute (RPM)	5-30 RPM	Not Applicable	Not Specified
EQUIPMENT VALVE EXERCISER REACH	Same as Type 2	Up to 27 inches	Up to 13 feet	Not Applicable	Not Specified
EQUIPMENT VALVE EXERCISE SUPPLY REQUIREMENTS	Same as Type 2	2-30 Gallons Per Minutes (GPM) at 2,000 pounds per square inch (PSI)	4-12 GPM at 2,000 PSI	Not Applicable	Not Specified
EQUIPMENT VALVE EXERCISER VALVE KEY	<ol style="list-style-type: none"> 1. 2-inch (") nut to a depth of 6 feet (') rated for 2500ft/lb of torque 2. 3'-8" extensions to extend reach depth 	2" nut to a depth of 6' rated for 2500ft/lb of torque	2" nut to a depth of 6' rated for 800ft/lb of torque	Not Applicable	Not Specified

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
EQUIPMENT VACUUM PUMP	Same as Type 2	Same as Type 3	450 cubic feet per minute (CFM)	Not Applicable	Not Specified
EQUIPMENT VACUUM DEBRIS TANK	200 gallons	Same as Type 3	90 gallons	Not Applicable	Not Specified
EQUIPMENT VACCUM HOSE DIAMETER	Same as Type 2	Same as Type 3	3"	Not Applicable	Not Specified

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Repair and Startup Team - Water Distribution System
2. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure

WATER PUMP, DEWATERING

DESCRIPTION	The Water Pump, Dewatering is intended to lower the water level of contained water sources or remove water from a localized area.
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Equipment
OVERALL FUNCTION	The Water Pump, Dewatering remove water from trenches, drains, and other area where water collection occurs.
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> Requestor provides comparable pump manufactured and model as necessary Requestor specifies the necessary gallons per minute (GPM) capacity, maximum solids handling, necessary equipment head, and equipment suction. Requestor specifies suction hose length required and strainer type/hole size Requestor specifies discharge piping connection type necessary: <ol style="list-style-type: none"> cam lock flex hose cam lock hard pipe threaded mechanical connection and length Requestor and provider to establish whether pumps are trailer-mounted or skid-mounted. Can be ordered with staff using the NIMS Utility Worker Specialist – Water Sector Infrastructure

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
EQUIPMENT DESCRIPTION	Same as Type 2, PLUS: <ol style="list-style-type: none"> Dry prime up to 26 ft Solids handling up to 5 inches (") unscreened materials 	Same as Type 3, PLUS <ol style="list-style-type: none"> Dry prime to 15 ft 	Same as type 4, PLUS: <ol style="list-style-type: none"> Solids handling up to 3" unscreened materials 	<ol style="list-style-type: none"> Self-priming Dry prime up to 26 ft Solids handling up to 2.5" unscreened materials Self-contained diesel power supply Automatic start/stop Portable 	Not Specified
EQUIPMENT HEAD (FEET)	75	40	65	65	Not Specified
EQUIPMENT PUMP CAPACITY (GALLONS PER MINUTE)	4,200	3,000	1,660	700	Not Specified



Resource Typing Definition for Infrastructure Systems
Public Works

Water Sector Resource

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
EQUIPMENT SUCTION SIDE (INCHES)	10	8	6	4	Not Specified
PERSONNEL TRAINED OPERATOR	Same as Type 2	Same as Type 3	Same as Type 4	Not Specified	Not Specified

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure

WATER PUMPS, DRINKING WATER SUPPLY – UNTREATED SOURCE

DESCRIPTION	The Water Pump, Drinking Water Supply – Untreated Source pumps untreated water to a water treatment plant
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Equipment
OVERALL FUNCTION	The Water Pump, Drinking Water Supply – Untreated Source servers as a temporary pump to supply the water treatment plant with source water for processing
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor provides comparable pump manufactured and model as necessary 2. Requestor specifies the necessary gallons per minute (GPM) capacity, maximum solids handling, necessary equipment head, and equipment suction 3. Requestor specifies any materials/equipment necessary to meet deployment requirements 4. Requestor specifies the size and suction of discharge connections 5. Provider establishes whether pumps are trailer-mounted or skid-mounted 6. Can be ordered with staff using the NIMS Utility Worker Specialist – Water Sector Infrastructure

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
EQUIPMENT DESCRIPTION	Same as Type 2, PLUS: 1. Portable skid/trailer mounted (6,500 lbs.)	Same as Type 3, PLUS: 2. Portable skid/trailer mounted (4,959 lbs.)	Same as Type 4, PLUS: 1. Portable skid/trailer mounted (3,200 lbs.)	Same as Type 5, PLUS: 1. Solids handling to 3" 2. Self-contained diesel power supply 3. Portable skid/trailer mounted (1,734 lbs.)	Weight varies between manufacturers (1,500 to 7,000 lbs). Requestor should specify any weight restrictions.
EQUIPMENT HEAD (FEET)	50	Same as Type 3	35	20	Not Specified
EQUIPMENT PUMP CAPACITY (GALLONS PER MINUTE)	3,500	Same as Type 3	2,000	700	Not Specified
EQUIPMENT SUCTION SIDE (INCHES)	10	8	6	4	Not Specified

COMPONENT	TYPE 5	TYPE 6	TYPE 7	TYPE 8	NOTES
EQUIPMENT DESCRIPTION	1. Self-priming 2. Solids handling up to 2-inches ("") 3. Self-contained diesel power supply 4. Automatic start/stop 5. Portable skid/trailer mounted (1,586 lbs.)	Not Applicable	Not Applicable	Not Applicable	Weight varies between manufacturers. Requestor should specify any weight restrictions.
EQUIPMENT HEAD (FEET)	40	Not Applicable	Not Applicable	Not Applicable	Not Specified
EQUIPMENT PUMP CAPACITY (GALLONS PER MINUTE)	300	Not Applicable	Not Applicable	Not Applicable	Not Specified
EQUIPMENT SUCTION SIDE (INCHES)	3	Not Applicable	Not Applicable	Not Applicable	Not Specified

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure

WATER PUMP, WASTEWATER

DESCRIPTION	The Wastewater Pump, Wastewater lift and move wastewater through a pressure piping system
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Equipment
OVERALL FUNCTION	The Wastewater Pump, Wastewater supports the temporary bypass of lift and pump stations to maintain wastewater collection.
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor provides comparable pump manufactured and model as necessary 2. Requestor specifies suction hose length required and strainer type/hole size 3. Can be ordered with staff using the NIMS Utility Worker Specialist – Water Sector Infrastructure 4. Requestor specifies discharge piping connection type required: <ol style="list-style-type: none"> a. Cam lock flex hose b. Cam lock hard pipe c. Threaded mechanical connection and length

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
EQUIPMENT DESCRIPTION	Same as Type 2, PLUS: 1. Dry prime to 20 ft	Same as Type 3, PLUS: 1. Dry prime to 26 ft 2. Solids handling to 5 inches (*) unscreened materials	Same as type 4, PLUS: 1. Solids handling to 4" unscreened materials	Same as Type 5	Not Specified
EQUIPMENT HEAD (FEET)	88	50	120	100	Not Specified
EQUIPMENT PUMP CAPACITY (GALLONS PER MINUTE)	8,600	6,000	4,500	1,900	Not Specified
EQUIPMENT SUCTION SIDE (INCHES)	12	10	8	6	Not Specified
PERSONNEL ONSITE SETUP TEAM	Same as Type 2	Same as Type 3	Same as Type 4	Same as Type 5	Not Specified
PERSONNEL TRAINED OPERATOR	Same as Type 2	Same as Type 3	Same as Type 4	Same as Type 5	Not Specified

COMPONENT	TYPE 5	TYPE 6	TYPE 7	TYPE 8	NOTES
EQUIPMENT DISCRIPTION	1. Self-priming 2. Dry prime to 20 ft 3. Solids handling to 3" unscreened materials 4. Self-contained diesel power supply 5. Automatic start/stop 6. Portable skid/trailer mounted	Not Applicable	Not Applicable	Not Applicable	Not Specified
EQUIPMENT HEAD (FEET)	72	Not Applicable	Not Applicable	Not Applicable	Not Specified
EQUIPMENT PUMP CAPACITY (GALLONS PER MINUTE)	885	Not Applicable	Not Applicable	Not Applicable	Not Specified
EQUIPMENT SUCTION SIDE (INCHES)	4	Not Applicable	Not Applicable	Not Applicable	Not Specified
PERSONNEL ONSITE SETUP TEAM	2	Not Applicable	Not Applicable	Not Applicable	Not Specified
PERSONNEL TRAINED OPERATOR	2	Not Applicable	Not Applicable	Not Applicable	Not Specified

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 509: Utility Worker Specialist – Water Sector Infrastructure

WATER PUMP, WATER DISTRIBUTION

DESCRIPTION	The Water Pump, Water Distribution pumps potable water to a pressurized/elevated water system
RESOURCE CATEGORY	Public Works
RESOURCE KIND	Equipment
OVERALL FUNCTION	The Water Pump, Water Distribution pumps water through the water distribution system to bypass disrupted areas
COMPOSITION AND ORDERING SPECIFICATIONS	<ol style="list-style-type: none"> 1. Requestor provides comparable pump manufactured and model as necessary 2. Requestor specifies the necessary gallons per minute (GPM) capacity, net positive suction head (NPSH) and discharge head 3. Requestor specifies any materials/equipment necessary to meet potable water deployment requirements 4. Requestor specifies specialized pipe material needs such as flexible pipe for connections across fault lines 5. Requestor specifies any dimensional limitations 6. Requestor specifies the size and suction of discharge connections 7. Requestor specifies pump and parts disinfection certification as necessary 8. Can be ordered with staff using the NIMS Utility Worker Specialist – Water Sector Infrastructure

Each type of resource builds on the qualifications of the type below it. For example, Type 1 qualifications include the qualifications in Type 2, plus an increase in capability. Type 1 is the highest qualification level.

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
EQUIPMENT DESCRIPTION	Same as Type 2	Same as Type 3, PLUS: 1. Weight: 10,500 lbs. (approximately)	Same as Type 4, PLUS: 1. Weight: 5,000 lbs. (approximately)	<ol style="list-style-type: none"> 1. Dry-prime pump 2. Self-contained diesel power with fuel supply 3. Weight: 6,500 lbs. (approximately) 4. Skid mounted 	Weight varies between manufacturers. Requestor should specify any weight restrictions.
EQUIPMENT HEAD (FEET)	145	160	168	150	Not Specified
EQUIPMENT PUMP CAPACITY (GALLONS PER MINUTE)	6,000 to 8,000	4,000 to 6,000	2,000 to 4,000	500 to 2,000	Not Specified
EQUIPMENT SUCTION DEPTH (FEET)	Same as Type 2	Same as Type 3	Same as Type 4	10	Not Specified
PERSONNEL ONSITE SETUP TEAM	Same as Type 2	Same as Type 3	Same as Type 4	2	Not Specified

COMPONENT	TYPE 1	TYPE 2	TYPE 3	TYPE 4	NOTES
PERSONNEL TRAINED OPERATOR	Same as Type 2	Same as Type 3	Same as Type 4	2	Not Specified

NOTES

Nationally typed resources represent the minimum criteria for the associated component and capability.

REFERENCES

1. FEMA, NIMS 508: Repair and Startup Team – Water Distribution System

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About AWWA

AWWA is an international, nonprofit, scientific and educational society dedicated to providing total water solutions assuring the effective management of water. Founding 1881, the Association is the largest organization of water supply professionals in the world. Our membership includes nearly 4,200 utilities that supply roughly 80 percent of the nation's drinking water and treat almost half of the nation's wastewater. Our over 50,000 total memberships represent the full spectrum of the water community: public water and wastewater systems, environmental advocates, scientists, academicians, and others who hold a genuine interest in water, our most important resource. AWWA unites the diverse water community to advance public health, safety, the economy, and the environment.